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# **Implications of Management Control Systems for Green Supply Chain Management in South Africa: a case study of a food retailer**

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Department of Accounting



University of Cape Town

In partial fulfilment for degree:  
Masters in Commerce: Strategic Cost Management

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# ACKNOWLEDGEMENTS AND DECLARATION

This report is confidential to the Department of Accounting, Faculty of Commerce at the University of Cape Town and may use it freely.

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Finally, I thank my family, particularly my wife Bongiwe, for being a pillar of strength throughout my coursework and on this research, and also my mother for her continued support.

I certify that this report is my own work and all references used are accurately reported in footnotes.

Signed by candidate

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## ABSTRACT

The concept of Green Supply Chain Management dominates industries at large in today's business environment. The competitive advantage of companies is no longer limited to product, price, and place but extends to the overall service offering that centres on the environmental consciousness of its supply chain. Green supply chains are increasingly providing a competitive advantage in today's fast changing retail marketplaces.

The impact of a well-managed and responsive green supply chain network has the potential to be more effective than the sum total of its individual parts. Information sharing, co-operation, and collaboration for mutual benefit between members of a green supply chain have the ability to drive increased performance and revenues for all participants in the process. The field of green supply chain management is therefore a fundamental driver for companies wishing to be successful.

This research investigates the management of green supply chains through the major implications of management control systems. Green supply chain management characteristics that define high performing buyer-supplier engagements were: sustainability, performance management, quality management, shared investment, waste reduction, and the relationship between partners.

This study found that a buying firm needs to employ management control systems in ensuring the supplier outputs. Collaborative management, another important facet in effectiveness of green supply chain management, was found to define successful buyer-supplier relationships. The study also found challenges with initial investment and opportunism, that companies should safeguard themselves through substantive agreements. Mutual investment by both manufacturer and retailer into their operations enhances service to customers and managing relationships in green supply chain management.

**KEY WORDS:** *Management control systems, Green supply chain management, performance management, collaborative relationship, cost management, mutual investments, buyer and supplier.*

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## ACRONYMS AND ABBREVIATIONS

BSC	Balance Scorecard
CEO	Chief Executive Officer
DC	Distribution Centre
DFE	Design for the Environment
ED	Enterprise Development
EOQ	Economic Order Quantities
EMS	Environmental Management System
EPR	Extended Producer Responsibility
ERP	Enterprise Resource Planning
FDA	Food and Drug Administration
FSC	Forestry Stewardship Council
GSCM	Green Supply Chain Management
HDPE	High-density polyethylene
ISO	International Organization for Standardization
KPI	Key Performance Indicators
MCS	Management Control Systems
NIR	Near Infrared
PET	Polyethylene Terephthalate
PMS	Performance Measurement System
PP	Polypropylene
PVC	Polyvinyl Chloride
QC	Quality Control
rPET	recycled Polyethylene Terephthalate
SANAS	South African National Accreditation System
SCM	Supply Chain Management
TQEM	Total Quality Environmental Management
TQM	Total Quality Management

# CHAPTER ONE: INTRODUCTION

Supply Chain Management (SCM) has been the foundation of a retailer's success, and it remains the primary competitive advantage in the retail industry (Heying & Sanzero, 2009). The distribution system is regarded as the most important aspect, with some retailers emphasizing greater transparency by sharing mutual trade secrets with their suppliers in order to attain greater efficiencies. Even though there are numerous logistical tasks, which permit a retailer to be the price and logistics leader through such efficiencies, the focus has primarily shifted towards the adoption of a fairly new strategy of making the logistical process more environmentally conscious (in other words, "going green"), whilst nonetheless attempting to reduce the carbon footprint of the business and strategically to contain the costs and/or increase profitability.

## 1.1 General background of the study

The study will focus on a South African retailer, Woolworths. Outlining the group's broader climate change context in *The Good Business Journey 2009* report, Woolworth's Chief Executive Officer (CEO) Simon Susman has committed the company to two ambitious goals: i.e. an intense focus on packaging and energy usage, while improving the impact of their supply chain activities on the environment. Many companies that attempt to make their business strategy more "green" realise quickly that upfront costs are higher and unavoidable. As a result may decide that they are simply not worth the investment. The assurance of potential savings down the road does not resonate with consumers, or with smaller suppliers (SMEs), in the same way as it does with big corporations (Heying & Sanzero, 2009).

Preceding research on Green Supply Chain Management (GSCM) has primarily focused on strategic and customer market demands (Trowbridge, 2001). "Green" practices also focus on reduction, reusing, remanufacturing, recycling and various disposable alternatives, especially as environmental regulations have become stricter (Sarkis, 2003). Greater enforcement through legislation of environmental laws (Zhu, Sarkis & Lai, 2007) has been accompanied by product stewardship. This entails post-consumer disposal initiatives such as product take-



back and design for the environment (DFE), which have been the focus of increasing profitability by reducing costs (Trowbridge, 2001).

Prior research, particularly within the South African context, has thus not investigated the impact of inter-company relationships in the implementation of GSCM practices. This is particularly when such relationships require close cooperation between buyer and seller, which may make it necessary to adapt management control systems (MCS). The relationship requires specific embeddedness where vital components and services are outsourced to external service providers or suppliers in order to ensure sustainability and continuity to conserve the expected economic advantages (Chivaka, 2006).

In a supply chain, a buyer-supplier interface is established through partnerships and/or contracting agreements. Effective SCM rests on the twin pillars of trust and communication (Tan, 2001). In developing green technologies, intensive capital investment is often required, which means that upfront capital costs are unavoidable (Heying & Senzaro, 2009).

The key risk issues facing the buyer-supplier interface are relationship management, association risk, opportunism, cost management and asset specificity, i.e. the finance and acquisition risk of the equipment required to implement GSCM. Investing in green technologies would require the supplier to conduct further research and development that may necessitate equipment upgrades, additional staff training to operate new machinery, a dedicated workforce, and the introduction of new processes and procedures, which may disrupt normal operations (Ramón, Álvarez-Dardet & Naranjo, 2008).

MCSs are thus a crucial aspect of implementing GSCM principles in inter-company relationships, predominantly where such relationships entail close cooperation between buyer and supplier. Chivaka (2006) acknowledges the observation of Cooper and Slagmulder (2004), to the effect that major design dependencies exist between buyer and supplier, with design changes influenced by the supplier. A cooperative buyer-supplier relationship is thus essential. The substantial abandonment of a distinct market trade creates a new organizational structure, in the form of either hierarchical or hybrid governance (Dekker, 2004). The organization structure created in either situation entails the establishment of suitable MCSs and processes to attain the desired cost targets (Van der Meer-Kooistra & Vosselman, 2000).

There are diverse methods of MCSs which an organizational structure can select based on objectives and values.

As defined by Whitley (1999), MCSs are a broad set of control mechanisms, designed to supply information feedback about performance, and to facilitate remedial actions, in order to assist organizations to regulate themselves. Expressed differently, Speklé (2001) has observed that MCSs are a purpose-based process or a set of devices and mechanisms that, through their influence on the behaviour of players within an organization, are intended to contribute to the achievement of the objectives of that organization.

Although the function of MCSs is to ensure that the desired outcomes are realised, the specific choice of the control structure in diverse inter-organizational arrangements is less obvious. Whitley (1999) argues that different types of MCSs and their features are better suited to particular enterprise configurations, different styles of managing organizations and the work carried out therein. In fact, Speklé (2001) argues that the classic challenge of studying MCSs revolves around explaining the control structure diversity within and between organizations.

For the buyer (retailer) to remain the market leader and maintain its competitive advantage within the industry, it needs to ensure that the supplier will remain committed to the relationship. Also for the supplier to undertake the necessary drastic changes and make the necessary investments in its operations, the supplier too needs re-assurance that the retailer will not abandon the partnership mid-way. Such obligations by the supplier would have to be regularised prior to large amounts of resources being committed to meet the buyer's demand (Ramón et al, 2008).

## **1.2 Problem Statement**

Current supply chain management practices in the retail industry are performed on a fragmented basis with unstructured communication and no clearly established responsibilities between the parties involved. This fragmentation creates gaps in the information flow, which affects the decision making process and lead to delays in transforming the supply chain (Heying and Sanzero; 2009).

Performance measurement is challenging in supply chains with multiple vendors, manufacturers, distributors and retailers, whether regionally or globally located, as it is difficult to attribute performance results to one particular entity within the chain. Measuring performance within organizations has challenges and even more challenges arise in inter-organizational environmental performance measurement. The reasons for lack the of inter-organizational performance measurement systems are multidimensional, which include non-standardized data, poor technological integration, geographical and cultural differences, differences in organizational policy, lack of agreed upon metrics, or poor understanding of the need for inter-organizational performance measurement.

Measuring the performance of supply chains is difficult for extra reasons, particularly when observing at numerous tiers within a supply chain, and green supply chain management performance measurement is essentially non-existent. Considering these barriers and difficulties, GSCM performance measurement is necessary for a number of reasons (including regulatory, marketing and competitiveness reasons). Overcoming these barriers is not a minor issue, but the long-term sustainability (environmental and otherwise) and competitiveness of organizations may rely on successful adoption of GSCM performance measurement (Hervani, Helms & Sarkis, 2005).

According to Bhagwat & Sharma, 2007, citing Gunasekaran, Patel, & Tirtiroglu, 2001; Hudson, Lean, & Smart, 2001, currently a number of firms have recognized the abilities of GSCM in day-to-day operations management. However, they consistently lack the insight for the development of effective performance measures and metrics required to attain a fully integrated GSCM due to lack of a balanced approach and lack of clear distinction between metrics at strategic, tactical, and operational levels. Thus, it is clear that for effective GSCM, measurement goals must take into account the overall scenario and the metrics to be used. These ought to represent a balanced approach and should be classified at strategic, tactical, and operational levels, and include financial and non-financial measures, as well.

### **1.3 Objective of the study**

The objective of this research is to investigate the contribution of MCSs in supporting inter-company relationships with regard to the risk of intensive capital investment and opportunism to facilitate the implementation of GSCM initiatives.

In developing new technologies, suppliers are critically important to the manufacturing needs of the retailer; hence, they are considered high risk because of issues such as sole sourcing and intellectual property. Supplier performance is evaluated on service, technical ability, quality, costs and flexibility, which are an essential part of the total quality management (TQM) and continuous improvement philosophy (Trowbridge, 2001).

Retailers and suppliers need to anticipate government legislation to regulate the industry by applying “Green Taxes and Penalties for non-compliance”, such as those initiated by developed countries. Being proactive in this regard could save their operations from incurring further unavoidable future costs in the form of penalties, while benefiting from any applicable tax concessions that might be implemented, such as “Green Miles”, which aim to encourage firms to develop and incorporate green technology within their core operating activities (Trowbridge, 2001).

Risk of opportunism refers to a situation where the supplier would want to maximise profits by offering the new technology to other industry players at the opportunity cost of the development partner. In the case of innovative methods, it may be necessary to incentivise the supplier to remain loyal to the partnership i.t.o. offering an exclusive supply to the retail partner and product development rebates to protect intellectual property. In addition, methods must be devised to manage the fixed costs of the supplier in order to remain competitive and meet consumer demands of affordability, i.e. having a product range offering, setting viable and sustainable timelines with further research and development partnered activities (Trowbridge, 2001).

## 1.4 Significance of the study

Clearly, this challenge requires the formulation of a theory to deal more compellingly and inclusively with the variety of control systems (Speklé, 2001). This is important because the application of MCSs in inter-organizational relationships raises issues around decision boundaries and relationship agreement challenges, which may impede inter-company controls. It is relevant, therefore, to make use of MCSs to investigate and therefore understand how inter-company relationships are managed when applying GSCM practices across the supply chain. MCSs provide a framework for the governance structure in inter-company relationships and thus assist in explaining the control structure (Chivaka, 2006).

As with Transaction Costs Economic theory, MCSs are based on organizational arrangements selected to govern specific trading terms due to their unique characteristics. They are embedded in a distinctive set of control devices that address the challenges presented by the transaction (Chivaka, 2006). The objective of the study is to examine some of the previously neglected control implications related to the application of GSCM in an inter-company relationship and to explain the governance structures and control devices that are used to support these MCSs.

The study will also examine the potential of the MCSs to provide a descriptive framework in understanding the inter-company control devices, which are required to facilitate cost management using GSCM practices. Accomplishing inter-company development initiatives entails information integration, supply chain coordination, and organizational relationship linkages, all of which require mutual commitment, dependence and trust, in the process of creating value for all supply chain companies (Ramón et al, 2008). The aim of this is to describe how MCSs are used in supply chains, and to explain the governance structure that is developed in order to facilitate the application of GSCM practices in an inter-company supply chain setting. Therefore the question to be addressed in this study is as follows:

*How can the relationship between a buyer and supplier be managed using MCSs in order to achieve the desired benefits of GSCM?*

## **1.5 Structure of the study**

The rest of the study is structured as follows: Chapter 2 reviews literature on the application of GSCM practices in the supply chain, against the background of a theoretical framework around MCSs. Chapter 3 outlines the research methodology. In Chapter 4, the findings of the case study are presented. In addition, the chapter examines the key insights that emerged from the analyses, and details how the research question was answered. Chapter 5 summarises the major findings of this research, describing how environmentally conscious practices are applied in a green supply chain and in the control devices used to manage the inter-company relationships, as well as identifying the contribution of this research, and possible areas for further research.

## **CHAPTER TWO: LITERATURE REVIEW**

In Chapter 1, the significance of incorporating management control systems (MCS) into green supply chain management (GSCM) is considered in order to manage the relationship of inter-company initiatives and transactions. In the area of GSCM, much of the research done had primarily focused on aspects of green purchasing, environmental management standards (ISO14001), product development, cost management, competitive advantage, customer service and adherence to specific environmental laws. However, little work has been done to measure the performance of GSCM. To understand how the inter-company relationship can be managed and what the green supply chain is, the literature review will explore some of the concepts that relate to MCSs and GSCM (Hervani, Helms & Sarkis, 2005).

### **2.1 The concept of supply chain management**

Supply chain management (SCM) is a set of approaches that is utilized to integrate efficiently all the suppliers, manufacturers, warehouses, and stores. This is in order for merchandise to be produced and distributed in the right quantities, to the right locations, and at the right time. It is intended to minimize system wide costs while satisfying service level requirements (Simchi-Levi, Kaminsky & Simchi-Levi, 2004).

The supply chain, as defined by the Supply Chain Council (2000), is a connection of business processes that are engaged through upstream and downstream linkages to create value in supplying products and services to the consumer (Tsamenyi, Cullen & Chivaka, 2005). Fundamentally, supply chains are processes that entail integration along the chain, and SCM aspires to unify the systematic planning and control of all technologies, materials and services of companies in the value chain with the intention of meeting customer needs. The organization must thus work actively beyond its own authorized boundaries to establish relationships with suppliers and customers along the value chain.

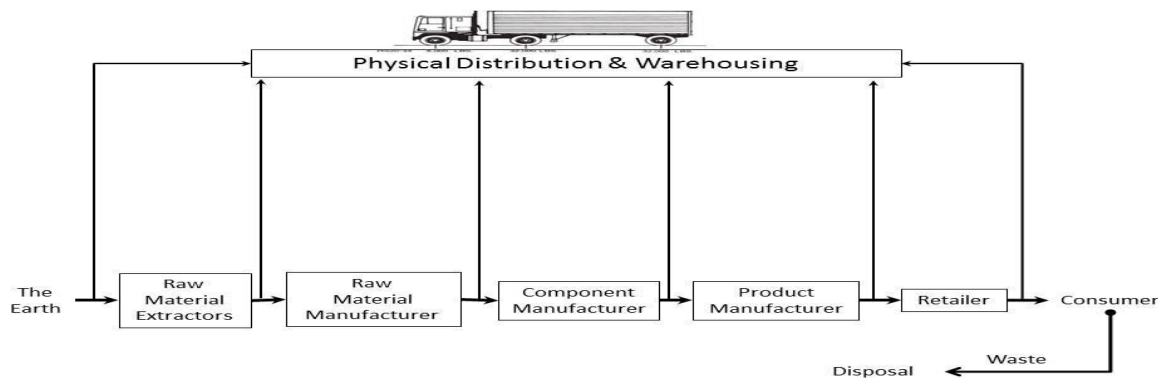


Figure 1: Basic activities and firms of a supply chain (*Source: New, S.J., and Payne, P., (1995). "Research frameworks in logistics: three models, seven dinners and a survey". International Journal of Physical Distribution and Logistics Management Vol. 25, No. 10, pp 60-77*)

To realise the benefits of SCM, the inter-company relationship between supplier and buyer (customer) should be characterised by a long-term perspective, mutual commitment, intense information exchange, a limited number of suppliers, multiple supplier selection criteria, trust, and mutual dependence (Holm, Erikson & Johanson, 1999; Spina & Zotteri, 2000). Therefore, to realize specific objectives and benefits, SCM emphasises the overall and long-term benefits to all parties along the supply chain, through mutual co-operation and information sharing (Tsamenyi et al, 2005).

As noted by Hervani et al (2005), the supply chain in business is a critical operating function. The process includes sourcing of raw materials and parts, the manufacturing and assembling of products, storage, order entry and tracking, distribution through a range of channels and finally delivery to the customer. A company's supply chain configuration consists of external suppliers, internal business functions and external distributors, as well as the end-user or commercial customers. Firms may concurrently belong to multiple supply chains. Global players spread across geographic boundaries and multiple zones further complicate the management and coordination of supply chains. Customer expectations, globalisation, information technology, government regulation, competition and the environment also influence the successful management of a supply chain.



Furthermore, as a result of non-standardised data, poor technological integration, geographical and cultural differences, differences in organizational policy, lack of agreed upon metrics or poor comprehension of the need for inter-organizational performance measure, which are multifaceted, there are no systems to measure performance across organizations.

### **2.1.1 Decision phases in a supply chain**

With reference to Garg (2007), as proposed by Chopra and Meindl (2006), successful SCM needs numerous decisions relating to the flow of information, product, and funds. Every decision must increase the benefits in operating the supply chain. These decisions fall into three categories or phases, dependent on the rate of recurrence of each decision and the time frame during which a decision phase has an impact:

#### **❖ Supply chain strategy or design:**

In this phase, a company decides how to structure the supply chain over the next few years, taking into account the set marketing and pricing plans for a product. It determines what the chain's configuration should be, how resources should be allocated, and what processes should be performed at each stage (Manrodt et al, 2005). Companies make strategic decisions such as whether to outsource or perform functions in-house, based on the location and capacities of production and warehousing facilities, the products to be manufactured and stored at different locations, the forms of transportation required along the different shipping stages and the type of information system to be utilized (Chopra & Meindl, 2006). This supply chain configuration must support strategic objectives and its efficiency must be increased during this stage of supply chain design decisions which are usually prepared for the long term (over several years) and are extremely costly to modify on short notice. As a result, when companies make these decisions, they must take into account uncertainty in anticipated market conditions over the next few years (Quinn, 2000).

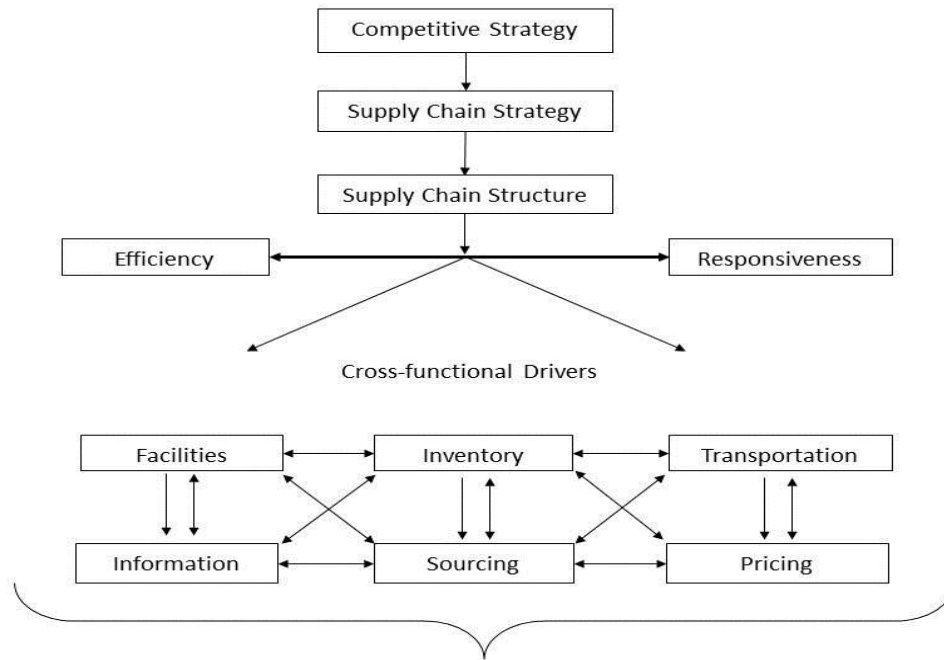


Figure 2: Supply Chain Decision Making Framework (Source: Chopra S. & Meindl P. (2006), Supply Chain Management – Strategy, Planning and Operation, p.47. 3rd Edition, Pearson Education.)

#### ❖ Supply chain planning:

The time frame to be considered for decisions that are made during this phase is from a quarter to a year. The supply chain's configuration is established and fixed during the strategic phase. In this configuration, constraints are established within which the plan must be implemented. Given the constraints recognized during the strategic or design phase, the goal of planning is to maximize the supply chain surplus that can be generated over the planning scope. Companies commence the planning phase with a forecast for the coming period of demand in the various markets. Decisions regarding which markets should be supplied from which locations, the subcontracting of manufacturing, the inventory policies to be followed, and the timing and size of marketing and price promotions to be conducted are all included in planning (Lamber, 2004). During the planning phase, companies must include uncertainty in demand, fluctuation in exchange rates, and competition over this period. Companies in the planning phase must integrate any flexibility built into the supply chain in the design phase and exploit it to optimize performance, given the shorter time frame and better forecasts than were originally available during the design phase. Companies will also tend to define a set of operating policies that govern short-term operations, as a consequence of the planning phase (Simchi-Levi et al, 2004; Slone, 2004).

### ❖ **Supply chain operation:**

During this phase, companies make decisions regarding individual customer orders, on a weekly or daily basis. At the operational level, supply chain configuration is deemed fixed, with the planning policies already defined. The objective of supply chain operations is to manage incoming customer orders in the best possible manner. In this phase, firms allocate inventories or production to all individual orders, they set a date on which an order is to be completed, and they prepare programme pickup lists at a warehouse; they also allocate an order to a particular shipping mode and shipment, set delivery schedules of trucks, and place replenishment orders. There is less uncertainty about demand information, since operational decisions are being made in the short term (minutes, hours, or days) (Manrodt et al, 2005). The aim during the operation phase is to exploit the reduction of uncertainty and optimize the performance, given the constraints established by the configuration and planning stages.

The overall profitability and success of a supply chain is thus strongly influenced by the design, planning, and operation phases. It is thus reasonable to conclude that a large part of the success of global firms can be attributed to their effective supply chain design, planning, and operation (Chopra & Meindl, 2006).

The advantage of SCM is that it can develop cooperative, mutually beneficial, long-term relationships between buyers and suppliers within the supply chain. There are numerous benefits to this, such as the development of trust between buyer and supplier. Decisions on how to resolve cost reduction efforts can be made with shared information on the various aspects of each other's operations. In several organizations, the buyer may expend some of its resources to train the supplier's employees to work with the buyer to understand a new product. Clearly, such interactions are different from the short-term antagonistic relationships that are characteristic of a traditional buyer-seller relationship (Atkinson, Kaplan, Matsumura and Young, 2007).

## 2.2 The concept of Green Supply Chain Management

Sarkis and Rasheed (1995), Klassen and McLaughlin (1996), and King and Lenox (2001), cited by Hervani et al (2005) observed that several studies have studied the concept of environmental sustainability as a framework for studying management practices in both operational and strategic contexts. As part of this endeavour, other studies have observed the greening of supply chains within different contexts, including in product design (Allenby, 1993; Gupta, 1995), process design (Porter & Van der Linde, 1995; Klassen & McLaughlin, 1996), manufacturing practices (Winsemius & Guntram, 1992), purchasing (Handfield et al, 2002) and a broad combination of these elements (Bowen et al, 2001). Adding the component “green” to SCM entails addressing the influence on and relationships of SCM to the natural environment. Even if it is motivated by an environmentally conscious attitude, GSCM can also stem from a desire within organizations to become more competitive. GSCM can be defined as (Hervani et al, 2005):

$$\text{GSCM} = \text{Green Purchasing} + \text{Green Manufacturing/Materials Management} + \text{Green Distribution/Marketing} + \text{Reverse Logistics}$$

Hervani et al (2005) further observed that the GSCM equation can also be shown graphically, where reverse logistics “closes the loop” of a typical forward supply chain and incorporates reuse, remanufacturing, and/or recycling of materials into new materials or other products with value in the marketplace. The plan is to remove or minimize waste (energy, emissions, chemical/hazardous wastes, solid wastes). Various green practices should be apparent throughout the supply chain, ranging from green design (marketing and engineering), green procurement practices (e.g. certifying suppliers, purchasing of environmentally sound materials and products), total quality environmental management (TQEM) (internal performance measurement, pollution prevention), environmentally friendly packaging and transportation, to the various product end-of-life practices defined by reduction, reuse, remanufacturing and recycling. Webs of relationships formed by a number of organizational relationships can be found at the various stages of the model, including customers and their chains, as well as suppliers and their chains.

GSCM practices would very much support the development of industrial networks. The inter-organizational sharing of responsibility for various aspects of environmental performance is a

key element within GSCM. GSCM should support the sharing of environmental accountability and lend itself to attaining a reduced environmental load caused by industry. Numerous methods allow managers to plot the environmental impacts along supply chains, such as the life cycle assessment, product stewardship, and design for environment (DFE) principles, which are also complementary tools and values. A structural approach to identify and evaluate the total environmental load related to providing a service is life cycle assessment. It includes the development of data inventory, impact of materials, products and processes, and improvement analysis aspects. These elements of life cycle assessment are critical to GSCM performance measurement and metrics (Hervani et al, 2005).

Figure 3 illustrates the GSCM equation graphically, where reverse logistics “closes the loop” of a typical forward supply chain and incorporates reuse, remanufacturing, and/or recycling of materials into new materials or other products with value in the marketplace. This figure is representative of a single organization’s internal supply chain, its major operational aspects and its relationships with external organizations. Several environmentally conscious practices are evident throughout the supply chain, ranging from green design (marketing and engineering), green procurement practices (e.g. certifying suppliers, purchasing environmentally sound materials/products), TQEM (internal performance measurement, pollution prevention), environmentally friendly packaging and transportation, to a range of product end-of-life practices such as waste reduction, reuse, remanufacturing, recycling. Expanding this figure, a number of organizational relationships can be uncovered at different stages of this model, incorporating customer chains, as well as supplier chains, forming the webs of relationships (Hervani et al, 2005).

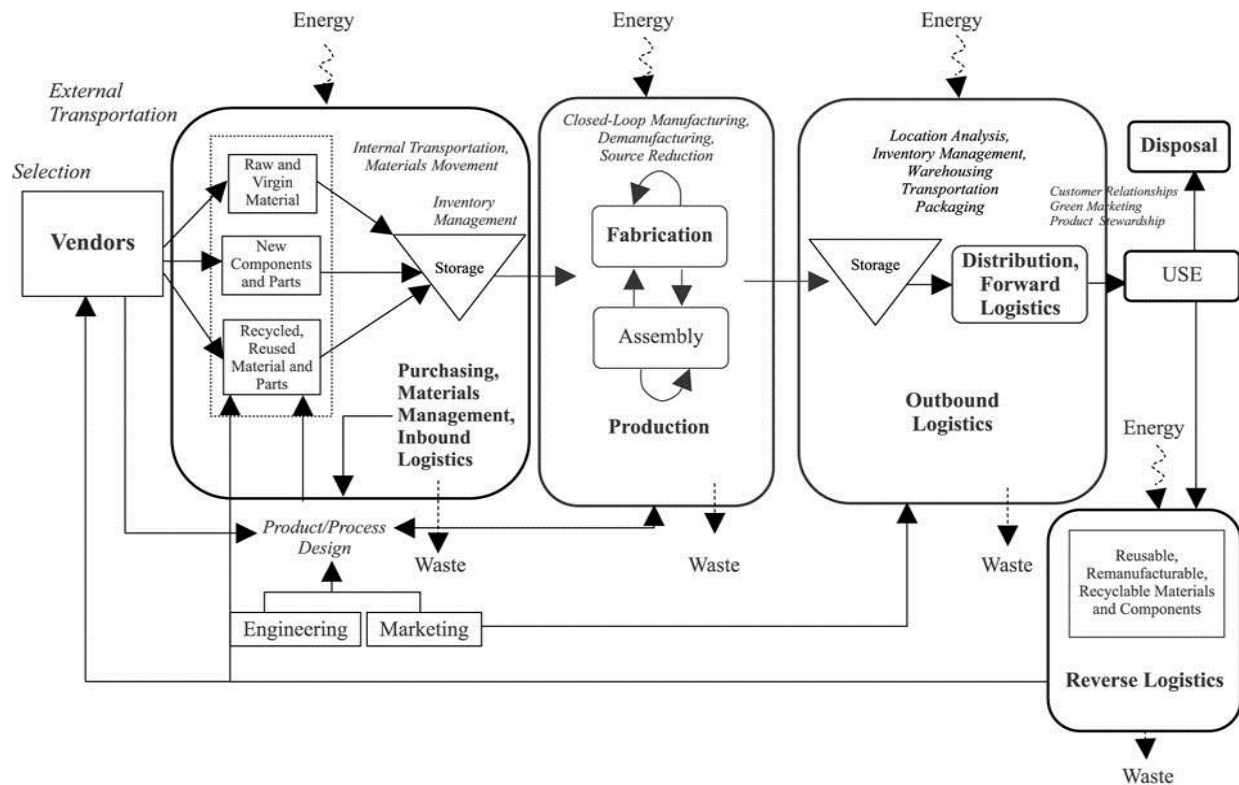


Figure3: Graph of the Green Supply Chain (Source: Hervani, A.A., Helms, M.H. and Sarkis J, (2005).

“Performance measurement for green supply chain management: Graph of the Green Supply Chain Management.” *Benchmarking: An International Journal*, Vol. 12 No. 4, pp. 330-353.)

Hervani et al (2005) also suggests that the development of industrial ecosystems would be significantly supported by GSCM practices. Korhonen and Niutanen (2003) in their study of material and energy flows in the local forest industry in Finland recommended that these flows were comparable to other economic and industrial systems. The concepts of product-based systems and geographically defined local-regional industrial ecosystems have emerged in the last twenty years. Their focus was on material and energy flows that seek to diminish the amount of raw materials used by industrial systems, and to reduce their waste and emission outputs. Korhonen (2002) concurs that the principle reflects the model of a sustainable natural ecosystem.

A key aspect of GSCM is the inter-organizational sharing of responsibility for various elements of environmental performance. GSCM should support the sharing of environmental responsibility and assist industry to achieve a reduced environmental burden. A number of methods can assist managers to plot the environmental impacts along supply chains, such as the life cycle assessment, product stewardship, and design for environment (DFE) principles,

all of which are also complementary tools and values for each other. Life cycle assessment is an organized approach to identify and assess the total environmental load associated with providing goods and service. It incorporates the development of a record of data, impact of materials, products and processes, and improvement analysis aspects. All these dimensions of life cycle assessment are critical to GSCM performance measurement and metrics (Hervani et al, 2005).

A firm's corporate environmental approach of pro-activity is the most commonly cited forecaster of GSCM implementation (Cramer, 1996; Drumwright, 1994; Ellram & Ready, 1998). Bowen et al (2001b) maintain that capabilities appropriate for green supply ought to be developed by a proactive corporate environmental position and a strategic purchasing and SCM approach. Well-developed SCM capabilities can alleviate the implementation of green supply and thus assist in propagating environmentally sound practices throughout the complex network of industrial buying and selling (Hervani et al, 2005).

Hart (1995) and Sarkis and Kitazawa (2000) maintain that the capabilities in total quality management (TQM) are able to alleviate the introduction of pollution prevention programs such as Waste Management at the disposal stage. Furthermore, capabilities in cross-functional management facilitate product stewardship, which is essential to GSCM, and they are related to organizational capabilities and pressures existing for the introduction of GSCM principles. TQM needs decisions based on data and continuous improvement through suitable performance measurement, which is also relevant for the more specific Total Quality Environmental Management (TQEM) paradigm. Amongst numerous studies relating to GSCM factors and performance measurement, Beamon (1999) suggests that the traditional performance measurement structure of the supply chain should be extended and include mechanisms for product recovery (reverse logistics) and the establishment and implementation of new performance measurement systems (PMS). However, overall environmental performance measurement and supporting systems across supply chains have not been as extensively studied so far, such as reusable, remanufacturable, recyclable materials and components.

## **2.3 Collaborative efforts required for relationship management**

As noted by Cheng, Yeh and Tu (2008), supply chains are created to attain a sustainable competitive advantage for all parties involved. The social and political concerns on environmental matters have encouraged manufacturing firms to “green” their supply chains (Van Hoek, 1999). To develop both economic and environmental performance simultaneously throughout their supply chains, green manufacturing firms have formed networks of suppliers or subcontractors to purchase environmentally advanced products and to build common practices in respect of waste reduction and operational efficiencies (Zhu & Cote, 2004). Green manufacturing firms often encourage their supply chain partners to develop an environmental management system (EMS) consistent with the ISO 14000 standards and to obtain the ISO 14001 certification (GEMI – Global Environmental Management Initiative, 2001), to ensure the regulatory compliance of their business practices. The EMS involves identifying new techniques and opportunities for effective management of environmental impacts, and their successful implementation. As such, green manufacturing firms may need to assist their supply chain partners to develop environmental management capabilities by providing training programs, financial guarantees and long-term supply contracts, as well as by sharing their green knowledge with each other.

Sharing of knowledge between organizations in green supply chains involves transferring or disseminating knowledge from green manufacturing firms to their partners with a view to developing new capabilities for effective actions. To attain the benefits of knowledge sharing, it is essential for all the inter-organizational parties involved to be in cooperative relationships (Dyer & Singh, 1998). Through collaborations between manufacturing firms and their preferred partners, a foundation of jointly held technological development can be created and maintained by means of knowledge sharing, enhancing mutual trust, understanding and expectations (Larsson et al, 1998). The strategic intent of inter-organizational collaborations for a sustainable competitive advantage can be achieved with effective knowledge sharing, by combining the relevant organizational resources and capabilities of all parties (Madhok & Tallman, 1998).

The value created by means of collaborative supply chains benefits all parties (Horvath, 2001). However, competition may arise when the green manufacturing firms and their supply chain partners need to capture specific business values created in the market and when they



need to protect their own interests. Alternatively expressed, parties to the green supply chain need to be in a cooperative relationship where cooperation and competition co-exist (Brandenburger & Nalebuff, 1996). In inter-organizational structures where knowledge is shared, cooperation will not only increase each party's knowledge base but also, ironically, each party's competitiveness, as knowledge is a source of competitive advantage (Loebecke et al, 1999). Consequently, it is likely that firms will not be less willing to share knowledge if they sense that what they might gain from cooperation may be outweighed by losses from relinquishing their monopoly over the knowledge. Although the sometimes difficult co-existence of cooperation and competition is acknowledged, so far it has not been examined or modelled.

To deal with this issue in green supply chains, Cheng et al (2008) developed a research model, where trust is treated as a mediating construct. This reflects the co-existence of cooperation and competition in situations where inter-organizational knowledge sharing is practiced. A lack of trust between collaborative partners may lead to competitive confusion, with regard to whether a partner is an ally or a competitor (Powell et al, 1996).

Overwhelmingly, the result from the model developed by Cheng et al (2008) suggests that trust is a significant factor in knowledge sharing activities of green supply chains. To realize the advantage of effective knowledge sharing, the related parties should reinforce their collaborative actions and activities specifically with regard to improving their trust. To improve the benefits of cooperation and to reduce the conflicts of competition when knowledge sharing is involved, it is important to focus on activities that improve mutual trust (such as participation and communication) and to avoid activities that undermine mutual trust (such as opportunistic behaviour and power) (Cheng et al, 2008). In such a relationship, the inter-organizational sharing of knowledge will be able to enhance the competitive advantage of supply chains as a whole.

## **2.4 Management Control Systems and its key elements**

Management control systems have been considered to influence individual behaviour in organizational settings. They are intended to align individual interest with that of the organization. An essential element of a management control process is adopting a formal

system which includes goal-setting, performance measurement and evaluation and incentives. (Rosanas & Velilla, 2004).

This section pursues to define what is meant by management control systems. Once the appropriate definitions have been addressed the section turns to present the framework used as a management control in practice. Both the limitations and advantages of the presented framework are discussed.

❖ Definition of “management control”

As observed by Câm Tú (2007) having cited Anthony (1965), who had conceptualised MCSs as the process by which managers ensure that resources are obtained and used effectively and efficiently in the accomplishment of the organization’s objectives. The intention was to expand the scope of information being measured beyond only accounting information and to bring matters of managerial motivation and behaviour into perspective (Otley, 1999).

The management control process is a mechanism by which managers at all levels ensure that the individuals they supervise implement their intended strategies (Anthony & Govindarajan, 2004).

According to Berry, Broadbent & Otley (2005), this definition echoes the current views of Anthony on MCSs, which has some continuity with his original approach, but abandons some elements such as:

Management control is mainly a process for motivating and encouraging people to execute organization activities that will further the organization’s objective. The process is also used to detect and correct unintentional performance errors and intentional irregularities, for instance theft or misuse of organizational resources (Anthony et al, 1989).

Formulations of strategy, controls by management and task controls have a distinctive and hierarchical relationship.

Management control fits between strategy formulation and task control in a number of respects based on organizational objectives and intended outcomes. Strategy formulation usually focuses on the long term, with task control focusing on short term operating activities, while management control ranges in between (Anthony, 1998).

Subsequently management control rests very strongly in the field of accounting (Berry et al, 2005). Between planning and control processes is the dynamic interplay, which is being ignored (Lowe & Puxty, 1989). Research on MCS had been widely developed in management accounting, particularly in conventional cost accounting and in behavioural and organizational accounting (Otley, 2001).

Described by Lawson (2010), MCSs are methods of gathering information that are used to guide and direct the behaviour of staff members and management in order to realize a company's goals. A MCS may use a range of techniques to evaluate various areas to improve performance and productivity. Some areas that MCSs may seek to address include accounting methods, employee incentive programs and performance measurement. Atkinson et al (2007) acknowledge that for the process of control to have importance and integrity, the organization must have the know-how and capacity to correct situations that it identifies as out of control; or else management control serves no purpose.

## **2.5 Need for management control systems**

With reference to Ramón et al (2008), inter-organizational relationships involve an embryonic form of co-operation between firms in order to attain mutual competitive advantages, such as access to new resources or markets. Different aspects of these relationships have been studied in fields such as business organization (Dyer, 1996), marketing (Wuyts & Geykens, 2005), or management accounting (Van der Meer-Kooistra & Vosselman, 2006). Within management accounting, studies have looked at the role of MCSs in SCM, where buyers and suppliers use management information to enhance coordination, diminish opportunistic behaviours and supply times and/or transaction costs (Van der Meer-Kooistra and Vosselman, 2006).

Management control literature regards management control information sharing to be imperative for coordinating and controlling joint activities between companies (Dekker, 2004; Tomkins, 2001). Thus, Van der Meer-Koistra and Vosselman (2000) found that information flow is a central element for the development of co-operative relationships between companies, particularly in the supply chain between buyers and suppliers (Dekker, 2004). However, the characteristics that shared information in an inter-organizational relationship should encompass in order to improve coordination and establish relationships that are long-lasting and beneficial for both parties remain unknown.

As stated by van Veen-Dirks and Verdaasdonk (2009), a supply chain is considered to be fully co-ordinated when all decisions are aligned to accomplish the objective of a global system supply chain, which is to provide value to the end consumer in terms of products and services, and for each channel participant to acquire a profit in doing so (Sahin & Robinson, 2002). Supply chain co-operation involves organizations and enterprises working together and can be observed as a concept going beyond normal commercial relationships (Matopoulos et al, 2007). Management control is the method by which managers influence other members of the organization to apply the organization's strategies (Anthony & Govindarajan, 2007). A MCS normally serves two roles:

1. the provision of relevant information; and
2. the motivation of individual managers within the firm (Otley, 2003).

These roles are specifically intended to alleviate the type of co-ordination problems as described by Sahin and Robinson (2002), i.e. incomplete information and incompatible incentives.

## **2.6 Forms of management control systems**

### **2.6.1 Performance evaluation of supplier**

Observed by Zhang (2001), there is a lack of assessment tools that are generally accepted and easy-to-use for GSCM. A small number of private and public corporations have their own regulatory framework for evaluating and comparing environmental proposals. Discussed below are several currently used approaches and associated concerns.

#### ❖ **Performance measuring method**

This method can be conducted in different modes. One way involves attributing points (or a certain number thereof) to each YES answer or area of compliance and adding the total scores for each of the suppliers. Procurement personnel may award an equal number of points to each individual category of criterion; others base this number on perceived priorities that were determined subjectively. As demonstrated by the Swiss evaluation system Zhang (2001), this does not necessarily lead to an optimal alternative from an environmental viewpoint. This system awards a total number of points for meeting a whole range of labels and standards. The existence of different categories influences the attribution of points and not only the product's environmental impacts. Widely ranging scores for the very same product can result due to the difference in criteria and scoring methodologies. This may send mixed messages to suppliers on the significance of environmental features (Zhang, 2001).

#### ❖ **Ad hoc evaluation**

Supplier input is evaluated on the 'general impression' basis that a supplier leaves on the evaluator. The risk with this method is that other factors, which are not essentially priorities from an environmental perspective, might end up determining a relatively large weight of the overall score. Ad hoc evaluation is usually the result of inconsistent and vaguely formulated questionnaire and criteria lists, which makes it impossible to compare the various offers on a sound basis (Zhang, 2001).

#### ❖ **Use of voluntary eco-labels and environmental management standards**

Procurement personnel may prefer these relatively easy-to-use evaluation tools in order to avoid the complicated task of assessing a product's environmental impacts themselves, for example, having all their strategic suppliers register their sites to International Organization for Standardization (ISO) 14001. These companies proclaim that ISO is a simple means of implementing its goal of 'greening the supply chain.' However reasonable this approach seems from an execution standpoint, it is uncertain to what extent ISO 14001 certified suppliers are in fact better environmental performers than non-certified companies with a sound environmental management system in place. Another, more product-focused evaluation method in this category is to compel suppliers to offer products, which are certified with at least one of the eco-labels, such as the Forestry Certification Council. In

recent policy discussions, some concerns have been raised on the validity of using eco-labels in green purchasing (Zhang, 2001).

Concerns include the potential for trade interferences, a lack of openness and objectivity in procedures for developing criteria, and public procurement rules that do not seem to account for the inclusion of voluntary eco-labels as a purchasing requirement. Furthermore, the purchase and maintenance of eco-labels is a costly and time consuming process that cannot be considered for every product, and it thus appears to be less suitable for use in green purchasing. In addition, from an environmental viewpoint, it is uncertain whether setting fixed criteria, as is done in eco-labels, will achieve the most benefits. Certainly, contracting authorities would eliminate the incentives for suppliers to go beyond these requirements, thereby hindering innovation (Zhang, 2001).

## **2.7 The Balanced Scorecard approach to performance measurement**

The Balanced Scorecard (BSC) framework by Kaplan and Norton (1992) is a management tool designed to articulate, execute and monitor strategy by utilizing a combination of financial and non-financial measures. The Balanced Scorecard is more than a performance measurement tool and, if applied correctly, should aid an organization to align and focus its entire resources according to its strategy. For many large complex organizations, the adoption of the Balanced Scorecard has proved to be a valuable tool in linking vision and strategy to day-to-day operations. For a number of organizations, however, this has been hindered, mainly due to a fundamental misapprehension of the management processes required for the business to perform well in the first place (Bhagwat & Sharma, 2007; CIMA, 2001).

Fundamentally, the Balanced Scorecard is a multi-faceted approach to performance measurement and management that specifically links business activities to organizational strategy (mission and vision). It is a tool for improving internal and external communications, and monitoring organization performance against strategic goals. It comprises four performance indicators, namely, customer perspective, internal-business processes, learning and growth and financial perspective (Kaplan & Norton, 1992).

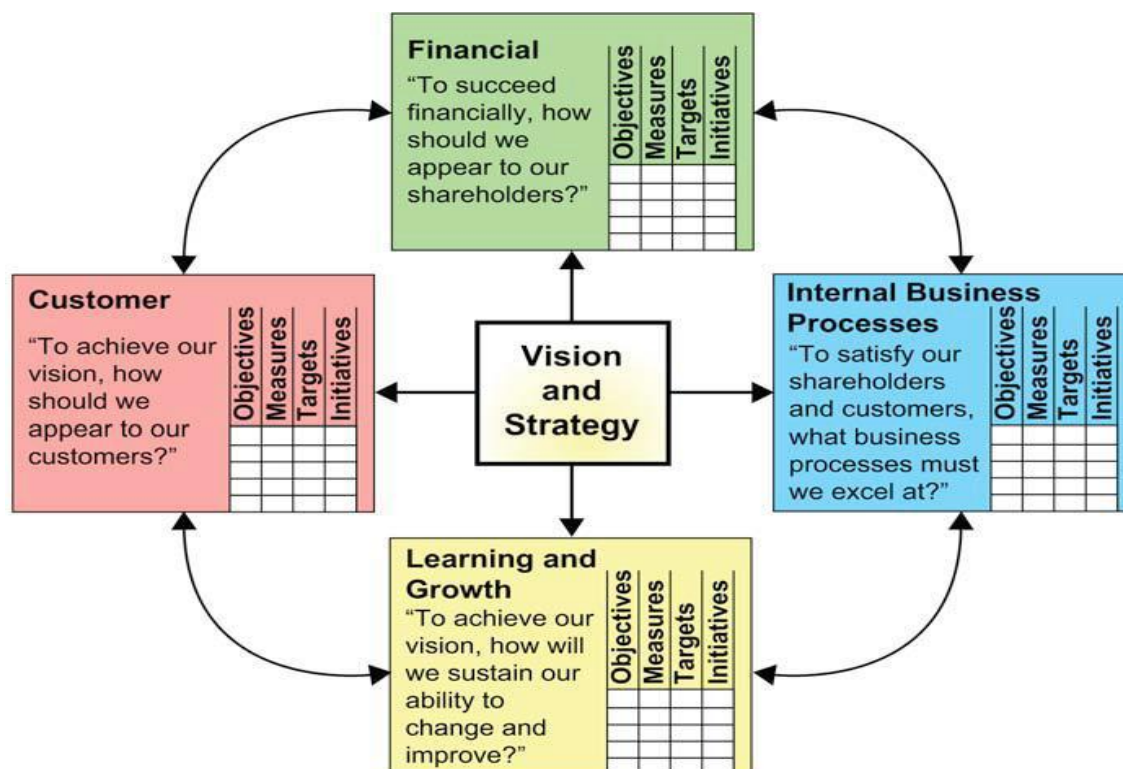
With referenced to figure 4, a key strength of the Balanced Scorecard approach is the importance it places on linking performance measures with business strategy. However, there is insufficient detail of how to select the specific performance measures to be placed in the Balanced Scorecard boxes. It is evident that some of these indicators must represent key result areas; but others need to integrate the strategic plans of the organization in reflecting the decisions that have been taken with regard to achieving those results. Sometimes it is proposed that the upper left-hand boxes (financial and customer) represent measured results, while the bottom right-hand boxes (business process and innovation and learning) represent the means by which the desired results can be attained. However, this is only true in the most straightforward situations (Otley, 2003).

The approach furthermore proposes that, in addition to financial measures of performance, attention should be given to the needs of customers, business processes and longer-term sustainability. Hence, the four areas of performance are identified; it is further recommended that up to four measures of performance can be developed (Kaplan & Norton, 1992) in each area. Now there are potentially 16 performance measures, which are not necessarily all-inclusive, but which ought to represent the critical success factors necessary for continued organizational success. Thus, it is intended that there is a close link between the business strategy adopted and the performance measures selected (Otley, 2003).

The role of feedback from the Balanced Scorecard approach has received little attention. Generally, feedback gives information about the extent to which a company is realizing its key strategic goals. In terms of this analysis, the Balanced Scorecard is clearly a dynamic tool, the contents of which change over time, as strategies develop and key success factors change. The scorecard literature recognizes this, but offers minimal guidance as to how it should be managed. With this approach, it is also made clear that the scorecard does not stand in isolation; rather, it is underpinned by traditional existing measurement systems. If an item does not appear on the scorecard, it does not imply that it is no longer measured and reviewed. Perhaps the scorecard can be seen as an embodiment of Simon's (1995) interactive control systems; that is, it reports on those measures which management have decided to emphasize for a period of time (Otley, 2003).

The Balanced Scorecard is intended to be at the core of an organization's control systems to set out an effective strategy and to link operational practices with strategic intent. However, it

cannot function as a stand-alone approach, and therefore its links with more traditional control systems need to be reviewed. The Balanced Scorecard is therefore a potentially influential tool by which management can be encouraged to address the basic issue of efficiently deploying an organization's strategic objective. It concentrates on establishing links that connect strategic objectives and performance measures; and it also pays attention to measuring the achievement of the components of the strategic plan the organization has adopted (i.e. the means that it considers will lead to the desired outcomes) (Otley, 2003).



Source: Kaplan and Norton (1996)

Figure 4: The balanced scorecard: a framework to translate a strategy into operational terms (Adapted from Robert S. Kaplan and David P. Norton, "Using the Balanced Scorecard as a Strategic Management System," *Harvard Business Review* (January-February 1996): 76.)

As outlined by Kaplan and Atkinson (1998), the BSC was intended to manage interaction on multiple, linked objectives that companies need to realize in order to compete on the basis of capabilities and innovation. The BSC evaluates organizational performance on a mix of financial and non-financial measures that are derived from the organization's vision, strategy



and objectives. It is primarily arranged into four perspectives of performance measure but not limited thereto, which are:

- Financial - Focus on success measures required by shareholders
- Customer – Focus on value creation for the customer
- Process – Focus on processes that are best to satisfy customer and shareholder expectations
- Learning & Growth – Focus on employee capabilities, information systems and organizational capabilities that are required to continually improve processes and customer relationships

The BSC is a general and flexible approach to performance measurement and widely used by companies around the world. A distinguishing feature is that it provides a framework that selects financial and non-financial performance measures from a company's strategy. The measures include but not restricted to, measures of operating, quality, and process improvement (Atkinson et al, 2007).

According to Bhagwat and Sharma (2007) having cited Chan (2003), performance measurement defines the feedback or information on activities related to meeting customer expectations and strategic objectives. It reveals the gaps and reflects on the need for improvement in areas with unsatisfactory performance. Thus efficiency and quality can be managed and improved on a regular basis.

Numerous organizations have realized the potentials of GSCM in day-to-day operations management. However, they regularly lack the insight for the development of effective performance measures and metrics required to attain a fully integrated GSCM. This is due to the lack of a balanced approach and lack of clear distinction between metrics at strategic, tactical, and operational levels. Therefore, it is apparent that for effective GSCM, measurement goals should consider the overall scenario and the appropriate metrics to be used. These should represent a balanced approach and be classified at strategic, tactical, and operational levels, and can be financial and non-financial measures (Bhagwat and Sharma, 2007).

A balanced SCM scorecard can be the basis for a strategic SCM system, such as GSCM. This would be on condition that certain development guidelines are properly followed, appropriate metrics are evaluated, and key implementation obstacles are overcome. The balanced scorecard points out the importance of key players in the performance measurement of GSCM, and the nature of roles they need to play. Furthermore, it not only assists organizations in faster and wider progress monitoring of their operations but can also benefit them in improving internal and external functions of business such as engineering and design applications, production, quality improvement, materials management, quick response, gaining lost market shares, and proper implementation of business strategies (Bhagwat and Sharma, 2007).

## **2.8 The performance management framework**

The contingency theory of management accounting implies that there is no commonly applicable system of management control but that the choice of appropriate control techniques will depend upon the circumstances surrounding a specific organization (Otley, 1999). A critical contingent variable concerns the strategy and objectives that an organization decides to pursue. These objectives are not only likely to influence profoundly the choice of performance measures to be used (i.e. the desired outcomes), but they also must act as the criteria against which the contingent choices that have been made can be evaluated (i.e. the 'goodness of fit' of the system). Every controlled system needs objectives and goals against which its performance can be measured (Otley & Berry, 1980); no specific contingent formulation is compulsory to anticipate that the existence of different goals is likely to involve the selection of different performance measures and controls. However, the formal PMS is perceived as the key mechanism that can be utilised to make explicit the set of means-end relationships that the organization has developed as the methods it will use to implement its strategic intent.

A key component of strategies is a time-frame. Numerous business strategies are designed to effect improvement, often driven by competitive pressures. Numerous approaches and techniques are currently used, which seek to increase goal attainment and to reduce the consumption of resources, such as continuous improvement, benchmarking, reverse (concurrent) engineering and target-costing. Such approaches do not only involve the

technical specification of goals, which must be achieved, but they are also necessarily concerned with issues of motivation and employee behaviour (Merchant & Manzoni, 1989). In management theory, goal-setting and performance measurement play an essential role, expressed in phrases, such as ‘what gets measured, gets done’ (Otley, 1999).

## **2.9 Application of MCS to managing green supply chain relationships**

Van Veen-Dirks and Verdaasdonk (2009) argue, that as a result of implementing (green) SCM practices, management processes now quite frequently go beyond authorized organizational boundaries. Consequently, caution must be applied when providing management with relevant information required to ensuring effective integration and coordination (Hopwood, 1996). One difficulty in attaining success in GSCM is that management control practice has normally limited its scope to the boundaries of the firm. This limitation makes it difficult for the firm to take advantage of, for instance, any cost reduction or product development synergies that exist across the green supply chain. Such synergies can only be realized by managing the cost-reduction or product development activities of multiple firms. The objective of GSCM is then to find lower-cost solutions, whilst incorporating environmental concerns, than would be possible if the firm and its buyers and suppliers attempted to reduce costs and carbon emissions independently (Kulmala et al, 2002).

## **2.10 Benefits of MCS to GSCM relationships**

In a green supply chain, the implementation of potential improvement proposals that have an effect on supply chain performance has many repercussions, and many obstacles have to be overcome. If the green supply chain leads to a reallocation of activities, for instance, it is possible that, initially, the costs and benefits will be divided incorrectly and unfairly among the individual players in the chain. Specific agreements must therefore be made about this. In these situations, intention statements or contracts, in which the cooperation and the apportionment of the costs and benefits have been regulated, need to be established in advance. However, these contractual agreements are not always adequate to attain successful cooperation (Seal et al, 1999). Lack of trust, opportunism, and problems with measuring

potential and real advantages are matters that may complicate cooperation. This raises the question of whether effective improvements in a green supply chain can be reached only by specifying contracts. A specification in advance of desired behaviour is not always probable if we think within the context of GSCM. Although the responsibility of the subcontractor in arms-length contracts is restricted to providing clearly specified products under clearly defined conditions, the role of the subcontractor within supply chains is much more complex and many different dimensions are part of the game (Heide, 1994; Ittner et al, 1999). Several aspects of the collaboration between the parties must be settled and both the provision of information and motivation of the individuals concerned must be handled effectively to solve any problems that might occur.

The demand for coordination therefore requires observation of management control issues with a more explicit awareness of the interdependencies between firms in the supply chain. These systems have traditionally been intended for a combination of hierarchical modes of governance and traditional arms-length transactions (Gietzmann & Monahan, 1996). However, the new hybrid organizations in supply chains are adequately different from markets or hierarchies to demand different modes of management control (Anderson & Sedatole, 2003). Hybrid organizations are classifying activities through inter-firm coordination and cooperation. Hybrid organizations exist because markets are supposedly unable to bundle the relevant resources and capabilities sufficiently (Teece & Pisano, 1994). Hybrids are also acknowledged by Williamson (1991) as a separate organizational form, as hybrid organizations are neither markets nor hierarchies.

## **2.11 The need for MCS in the GSCM**

The retail business has been described as a chain that makes goods and services available to the consumer, when and where required. To be able to service customer needs, the retailer should be aware of preferences, recognize the right products and their manufacturers, locate retail sites, and ensure the precise quantity to be available (Garg, 2007).

Although this appears to be simple, it is the most complex aspect of retailing. One can easily identify the level of complexity by observing a local branch store. Typically a branch store has a number of departments within like clothing, foods, gifts, cosmetics, kitchenware,

appliances and electronics. Take one such department such as foods; it will have sections for beverages, perishables, long life and children. Each section will further contain sub-sections for juices, yoghurts, meat, etc. Furthermore, each category in each sub-section will have different flavours, mixtures and sizes. It can be seen that compiling them together, it signifies a very large number of items. Adding to that the situation is exacerbated by the participation of buyers, merchandisers, stores management, finance, distribution and other function areas in the department store (Bajaj, Tuli, Srivastava, 2005). The branch store, in all likelihood, has hundreds of suppliers. A number of them could be manufacturers, some of them agents and others distributors. The confrontation of managing an environmentally conscious supply of goods from all the different entities is the challenge of managing a green supply chain (Pradhan, 2006).

The situation has become even more complex within the recent past few years. Globalisation helped relax border controls and thus easing trade barriers, which has encouraged retailers to source from new competitive markets. Whilst this is advantageous for the retailer, an inability to control carbon emissions and the cost involved used in raw materials, manufacturing, transportation, warehousing and the shipping of material to the end consumer will have an effect on the profitability of the business. The rise of a large number of operational and quality management and control mechanisms such as environmental consciousness has been seen in recent years. This has now been integrated within the domain of the Supply Chain Management Process to form Green Supply Chain Management.

However, as markets expanded and the retailers' business increased, with the number of products that offered by a retailer also increased. Thus retailers need to consider ways to integrate the whole supply chain to be able determine types of raw materials used in the manufacture of products. Added to that is a balanced approach of managing relations with suppliers in order to attain mutually beneficial means of greening the supply chain.

It is therefore the lack of understanding in literature of how MSCs are applied to manage green supply chain relationships, particularly observing the risk involved in the level of embeddedness of the parties involved, thus giving rise to this research. Thus, the current strategy for companies is to find appropriate criteria for selecting environmental friendly partners with whom they wish to do business. These criteria may vary according to the different circumstances. The future study trend is how to standardize these criteria and how to build up a complete vendor selection assessment system (Zhang, 2001).

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## **CHAPTER THREE: RESEARCH METHODOLOGY**

This study will focus on the emerging area of GSCM, particularly with regard to managing the buyer-supplier relationship. As described by Pullman and Dillard (2010), exploring SCM with a single case and a theoretical framework has become more common, particularly in emerging research areas. Consequently, this thesis focuses on a specific case study.

### **3.1 Research design**

The research design marks the direction of the whole research work and makes it relevant to the problems faced by an organization. The errors pertaining to the research problem or the potential errors that may arise can usually be eliminated by the research design (Saunders, Lewis & Thornhill, 2005). Research design can act as a blueprint for conducting the whole research project (Kale & Ahmed, 2002).

A case study design should be considered (Yin, 2003) when:

- (a) The study seeks to answer “how” and “why” questions;
- (b) The behaviour of those involved in the study cannot be manipulated;
- (c) The contextual conditions, which are relevant to the phenomenon under study, must be included; or
- (d) The boundaries between the phenomenon and the context are not clear.

An exploratory case study facilitates the exploration of a phenomenon within its context, using a range of data sources. This ensures that the matter is not explored from only one perspective, but rather from a variety of perspectives, thus allowing multiple aspects of the phenomenon to be revealed and understood.

This study was conducted in the form of an exploratory single case study methodology, by means of interviews and the collection and analysis of data relating to a single retail group of companies, namely the Woolworths Group. Woolworths’ key customer focus is on product quality and innovation. This has necessitated the company to be actively involved in management of its supply chain, by overseeing product from source of raw material to

customer consumption and the disposal of waste products. As a result, this ensures healthy food is acquired and produced in environmentally and socially responsible ways. Thus the research considers two major aspects of SCM as found in the literature review: greening the supply chain and managing of buyer-supplier relationship through implementation of management control systems (MCS) and integrated PMSs.

#### ❖ **Exploratory research**

Exploratory research accurately defines the problem, gathers required information/data pertaining to the problem and identifies alternative courses of action in order to deal with the problem. This type of investigation narrows the scope of the research by answering the question about the alternative courses of action available that might solve the problem and thereby to reach the final objective. Furthermore, exploratory research determines the productive alternatives of management that might not have been perceived. Although this kind of research is unstructured in character, it proves to be helpful by providing sufficient information in making a sound decision (Saunders et al, 2005).

### **3.2 Case study method**

Making use of a case study method, a researcher is able to closely observe the data within a particular context. A case study method selects a small geographical area or a very limited number of individuals as the subjects of study. Case studies explore and investigate contemporary real-life phenomenon through detailed contextual analysis of a limited number of events or conditions, and their relationships (Yin, 2003).

One definition of case studies is that they are:

A record of business related concerns which actually have been encountered by business managers. These are real and exclusive cases which are considered analysis, open discussion, and final decision as to the form of action which should be taken (Gupta, 2006).

Another definition of case studies is the following:

The case study method is essentially a qualitative research analysis pertaining to an organization. Usually, the case study method of research tends to focus on an



organization or at best two or three homogenous or competing organizations unless it is a cross organizational study to authenticate any management practices or approve or disapprove any hypothesis framed by a researcher to establish certain theories (Bhattacharyya, 2006).

The steps of a case study method are as follows (Gupta, 2006):

1. **Be complete:** It is essential that the case analysis is complete. There are two elements to this issue: Firstly, each area of the situation analysis must be considered; problems and opportunities must be identified; alternatives must be presented and evaluated using the situation analysis and relevant financial analysis; and finally, a decision must be made. An analysis that excludes parts of the situation analysis, or only recognizes one alternative, is not a good analysis. Secondly, each area must be covered in good depth and with insight.
2. **Avoid rehashing case facts:** Every case involves much factual information. A good analysis uses facts that are relevant to the situation at hand to make summary points of analysis. A poor analysis just restates or rehashes these facts without making relevant summary comments.
3. **Make reasonable assumptions:** Every case is incomplete in terms of some piece of information that you would like to have but that is missing. A researcher would like to have all the necessary information available. This is not possible for two reasons. Firstly, it would make the cases far too long to be capable of being analysed in a reasonable period of time. Secondly, and more importantly, the fact that information is incomplete is in fact an accurate reflection of what happens in the world of practice. Most or all decisions are made on the basis of incomplete information. Often, it just costs too much or takes too long to collect the desired information. A good case study analysis must make realistic assumptions to fill in the gaps of information.

In this study, an analysis of a specific retailer, namely Woolworths, is conducted by way of a case study. As the purpose of the research is to review an organization's integrated green supply chain strategy, it will critically examine the following: the channel network, the role of Information Technology (IT), the delivery mode, aggregate planning, etc. The process of presenting and defending conflicting points of view may be grounds for individual members

to reconsider the views they had of the case before the discussion began. This leads to a clearer perception of problems, to recognition of the many and often conflicting interpretations of the facts and events in the case, and to a greater awareness of the complexities of managerial decisions. Moreover, such a case study method also results in the development of skills by encouraging critical thinking.

The primary advantage of a case study is that an entire organization can be investigated in depth. This highly focused attention enables the researcher carefully to study the order of events as they occur, or to concentrate on identifying the relationships among functions, individuals and entities (Zikmund, 2003).

#### ❖ **Methods of data collection**

Primary data obtained by means of qualitative research was the main type of data collected; this involved the analysis of data obtained from interviews and made available by the participants and respondents during the interview process

Secondary data is data that has been gathered and recorded by someone else prior to (and for purposes other than) the current needs of the researcher; it is usually historical, already assembled and does not require access to respondents or subjects (Zikmund, 2003). It may be internal (such as company annual reports, brochures, websites etc.) or external (such as government reports, trade publications, books, journals, and business magazines).

An exploratory case study allows flexibility or adaptability whilst conducting the semi-structured interviews to allow more in-depth explanations and probing of issues that may emerge during the process, which the researcher may not have considered previously.

Data was collected by means of a voice recorder (dictaphone), transcriptions, and taking notes. A pre-determined interview questionnaire list was prepared to facilitate the gathering of relevant information. The interviews, which were conducted with knowledgeable executives and staff, were semi-structured, thus allowing additional pertinent information to emerge (Yin, 2003).

Email was utilised to follow up on questions and issues that emerged during the course of analysing the data and reviewing the literature.

### ❖ **Advantages of secondary data**

There are various advantages of the use of secondary data:

1. Collecting secondary data is relatively inexpensive. Company records, trade journals and government publications are obtainable at low cost. Therefore, no data collection forms such as questionnaires, interviews, and tabulations are required.
2. Data can be gathered quickly. Company records, library sources, and information on the internet can be accessed immediately. Many firms store reports in their retail information systems, such as on the intranet.
3. There may be numerous sources of secondary data – with many perspectives.
4. A secondary source may possess information that would otherwise be unavailable from the retailer. Government publications often contain statistics, which no private firm would be able to acquire.
5. When data is assembled by a source such as a government, results are usually plausible.
6. It helps to identify issues more specifically. Background information about a given issue can be gathered from secondary sources before undertaking a primary study.

### ❖ **Use of questionnaires for data collection**

A structured questionnaire was used to gather information about the specific relationship between the food retailer and its supplier. The questionnaire was divided into different sections, with each section embodying a specific theme.

The purpose of the questionnaires is to find out whether there is collaboration between a food retailer and its supplier. These practices entail factors underlying green supply chain strategies, the structure of the supplier-buyer relationship in order to adopt and implement green supply chain strategies, the use of processes that support the actual deployment of green supply chain strategies, the securing of costs involved, the mitigation of risks involved, performance management of desired outcomes, the equitable sharing of rewards, and the establishment of trust, which is needed to share confidential trade secrets, all of which together are expected to enable companies to create value.

The questionnaire is thus divided thematically into sections that address such characteristics. A section of the questionnaire considers the nature of MCS practices and techniques used by Woolworths. The information gathered in this section aids in formulating further questions to be asked during interviews.

Although the questionnaire was divided into different sections, the objective of the questions was to establish the nature of the trading relationship between a supplier and a food retailer with regard to adopting and implementing strategic initiatives to attain competitive advantage. Each theme in the questionnaire embodies a different approach to establishing the same thing: whether a given trading relationship conforms to the supply chain relationship.

Questionnaires were emailed directly to the personnel involved at the food retailer and followed up with a personal interview; any other queries arising from the questionnaires and the interviews were addressed via email.

### **3.3 Ethical implications**

Only the primary data obtained from the key informant interview is deemed to have potential ethical implications. These concerns were mitigated as follows: Written clearance was obtained from the relevant university ethics in research committee, written informed consent was obtained from the interviewee and the identity of the interviewee will kept anonymous.

### **3.4 Limitations of the study**

The research is limited specifically to this single case study and refers to the research methodology adopted, which is based on a limited sample. As the information is highly confidential, it is not feasible to present all the various parameters involved, and some information has not been fully disclosed in its entirety.

Yin (2003) validates the use of a single case study where a rare or unique event is being explored to probe the how and why questions in greater detail. Moreover, the application of data from just one particular industry clearly reduces the number of observations, but has the advantage in that firms are relatively homogeneous.

Woolworths has committed to find more environmentally responsible packaging solutions and to reduce its carbon footprint. Through collaboration with suppliers, Woolworths has therefore become the first and only local retailer to use post-consumer recycled plastics in food packaging.

## **CHAPTER FOUR: CASE STUDY ANALYSIS**

### **4.1 The Case**

Woolworths Holdings Limited is a South African based investment holding company, listed on the JSE Limited securities exchange; it generated revenue of almost R24 billion during its 2010 financial year. The company operates mainly through two subsidiaries, Woolworths (Proprietary) Limited and Country Road Limited, and through a joint venture, Woolworths Financial Services (Proprietary) Limited with Absa Bank.

Woolworths (Proprietary) Limited is a retail chain of stores offering a selected range of clothing, food and general merchandise, mainly under its own brand name. Woolworths operates 419 corporate stores throughout South Africa, Africa and the Middle East, after a board strategic decision to buy back all their franchise stores.

The Good Business Journey strategy is driving the green business practices at Woolworths (WW), and it is supported by the company's culture. This is evident in the values that underline how WW does business, which play a vital role in the company's quest for a unique customer value proposition. The market segment in which the company targets its products are environmentally conscious and this has become a competitive advantage over other retailers.

"The Woolies Difference" is a philosophy that defines the fundamental approach that underlines the company's behaviour in terms of creating customer value and business practices that are environmentally friendly. Encapsulated are the key WW values, namely, quality & style, value, service, innovation, integrity, energy, and sustainability.

"The Woolies Difference" philosophy enables the company to meet customer needs in an ever changing environment through business practices that engender environmental sustainability (Chivaka, 2010).

## **4.2 Background**

A management representative of the Good Business Journey strategy, confirmed Woolworths to be the first major South African retailer to use post-consumer recycled plastic in foods packaging. This initiative is line with its philosophy to find more environmentally friendly packaging solutions and to reduce its carbon footprint.

As from September 2010, Woolworths ready-to-eat sandwiches have been packed in containers made with 30% recycled Polyethylene Terephthalate (rPET), made from recycled plastic bottles. The recycled PET mainly comes from locally collected soft drink and water bottles and is scrupulously super-cleaned by the local supplier. The supplier invested R20 million in the acquisition of customised equipment for a food grade recycling plant. The resulting plastic product, rPET, meets and exceeds international standards for food safety.

## **4.3 Industry self-regulation of post-consumer PET recycling**

PETCO, the trading name of the PET Recycling Company (Pty) Ltd, represents the South African plastic industry's joint effort to self-regulate post-consumer PET recycling in anticipation of government legislation. PETCO was set up in December 2004 as a private company with the specific goal of promoting and improving the waste management and recycling of post-consumer PET products on behalf of all stakeholders in the PET industry in South Africa.

As an industry driven and financed environmental solution for PET, a voluntary recycling levy is paid by converters to PETCO on PET resin purchased and used for bottles. Support for PET recycling efforts guarantees an on-going financial value for post-consumer PET. This maintains collection interest and reduces the volume of post-consumer PET in the waste stream. On-going regular consumer and public education and awareness activities promote environmental responsibility and encourage PET recycling.

PETCO obligates accountability over the entire life cycle of PET products and packaging, by taking responsibility for post-consumer PET recycling. This implies that companies that

manufacture, import and/or sell PET products and packaging are financially and physically responsible for such products after their useful life.

Responsibility has been delegated to a third party, PETCO, in this particular case of post-consumer PET. The company therefore fulfils the PET industry's role of Extended Producer Responsibility (EPR). EPR supports the integration of environmental costs associated with PET products during their life cycles into the market costs of the products, and shifts the responsibility for waste from government to private industry.

With the establishment of PETCO, the PET industry has avoided draconian taxes in anticipation of government implementation of the National Environmental Management Waste Act of 2008. The industry has made an agreement with the Department of Trade and Industry to recycle at least 70% of all beverage plastic bottles by the year 2022. This has assisted the industry to find its own solutions on how to manage its waste through voluntary participation in individual initiatives.

As a result, the industry will not be under pressure to seek immediate comprehensive solutions on the recycling of PET bottles due to the 2022 year limit. Thus alternate products that could replace the use of PET might be shelved, to maximize the benefit of using rPET. The 70% target could be more specific as it may only apply within urban residential areas as the majority of people living in South Africa are dispersed over rural and informal settlement areas. In these areas recycling is not a primary concern and therefore not a worry to ordinary citizens. Punitive penalties could also be implemented for not meeting interim targets set to ensure progress toward goal attainment and those industry players not participative in the initiative.

Seemingly, PET users have realized the benefits of collaboration and sharing of information in order to attain a common goal. PETCO as an industry regulator would constantly focus on seeking solutions to manage the disposal of PET products, leaving the users to focus on their core business of either manufacture and/or retailing of consumer goods. This method of voluntary collaboration ensures that businesses do not perceive participation as another form of tax but as a cost of product improvement which can be attributable to research and development.



## 4.4 Greening the supply chain

Extrupet is a recycling facility located in Germiston, on the outskirts of Johannesburg, South Africa, on a dedicated site. The company has the capacity process up to 26,000MT per annum of plastic bottles. The process begins by receiving pre-sorted bottles in bale form with an average weight of 250kgs each into a completely integrated designed system that does the debaling, bottle prewash, auto-sort, and grinding.

### ❖ Process of manufacture

Extrupet makes use of NIR (Near Infrared) auto-sort technology. The company has employed the use of two of these machines, one after the other, so that it can completely exclude any contaminated bottles. The sorting of plastic bottles is done automatically by polymer types and by colour. This has enabled the company to significantly improve the quality of the end product whilst simultaneously allowing for an increased volume of bottles to be processed.

rPET flakes are pneumatically transported after being grinded and washed through a custom designed wash plant, which was purpose-built according to specific requirements. A more sophisticated wash system is utilized to clean the flakes further to improve purity prior to extrusion. In total, Extrupet employs three top-of-the-range extruders to ensure high quality levels on the end product and a further sophisticated automatic back-flush filtration system.

Apart from grime, people tend to use the bottles to store petrol, paraffin, benzene, urine and all sorts of other toxic substances, before disposing of them. To guarantee strict quality control, an in-house state of the art laboratory was built that is capable of testing ppm, ivy colour (amongst others) levels, thereby ensuring compliance with food safety requirements. The figure below illustrates the results of the food safety challenge test after contaminating the test bottles with toxic substances, particularly chloroform, phenylcyclohexan, benzophenon, and lindane. Samples sent to Fraunhofer and PIRA to check food safety could not spot the difference from virgin PET and rPET, with the machines yielding an average cleaning efficiency of 99.9%.

It can be observed that the process of recycle is highly complex. This requires technologically advanced equipment which may not be readily available in the market place. For a company

to invest in this type of expensive equipment a special and specific long-term partnership with organizations of similar shared values is required.

#### ❖ **Product safety and labelling**

Throughout the business, Woolworths is committed to maintaining the highest possible levels of product safety. Stringent safety standards are used to continually assess product design and manufacture. Food safety is vitally important to the business, and mechanisms in place ensure that consumers are offered products that have undergone thorough testing and rigid quality control processes to ensure they are as safe as possible. Processes include routine checks:

- from the Woolworths-appointed independent SANAS (South African National Accreditation System) accredited food laboratory, which runs unplanned routine checks for any potentially harmful micro-organisms and pathogens. It also routinely monitors pesticide residue levels and heavy metal levels in its products; and
- an independent auditing organization, International Britannia Limited (IBL), which conducts four hygiene audits a year per store where food is cooked to ensure that good food handling practices are in place.

The labelling policy of Woolworths ensures that customers are given adequate accurate information to let them make informed buying decisions. In terms of labelling, Woolworths is fully compliant with government requirements, which in addition to listing the country of origin, require details of fibre content and care instructions plus the importer's code for imported lines or the manufacturer's taxpayer number for local goods. Detailed information on ingredients, nutritional values and allergens is also contained on Woolworths' food labels.

Woolworths can randomly test its products to ensure that it meets the details on the product label, which is the customer's expectation. This control measure also ensures that the supplier is aware of product requirements and if any variations, are within the parameters of the agreement. The labelling is unique which is embedded on the product during manufacture and has been registered as a trademark. This safeguards the product from being replicated by competitors without being traceable.

## 4.5 Green supply chain strategy

Woolworths has clearly defined and detailed supply chain strategies for each major division within the group. The foods division took a strategic decision to shorten its buying cycle by shortening the critical path of goods, i.e. the shortest possible time it takes from placing an order for a product until it displays in-store. The thinking around this strategy was for the products to reach its stores as fresh as possible, to retain the quality of the products and maintain customer expectations, in line with its customer values

In order to attain this efficiency, Woolworths invested in an Enterprise Resource Planning (ERP) and Replenishment System. The ERP and Replenishment Systems link up all its stores with head office and suppliers in real time. It enables communication beyond just Economic Order Quantities (EOQ), to notify both suppliers and stores of the sales forecast. This facilitates supplier production runs of anticipated increase seasonal demands for particular stocks and quantities required for delivery at the agreed price. The objective of utilising such a system was to provide improved availability of replenishment items while reducing operating costs, such as waste (product shelf life), stock levels (lower stock levels to conserve cash flow), theft, damages (during packing and storage at stores), space rental, etc.

The strategy to source all (100%) products locally has resulted in an understanding of the value placed by the company on the quality of its products and the premium it is prepared to pay for locally manufactured goods. In order for Woolworths to consider sourcing 'like-for-like' products from overseas suppliers, the supplier would have to set up shop locally or to negotiate with a local manufacturer to maintain quality and price due to exchange rate fluctuations. Even though the current strength of the local currency (Rand) is favourable for importing, and its volatility remains a concern for future costing of products.

Design and innovation has been particularly noted as a weakness within the organization and therefore the company issued a challenge to its suppliers to source and/or design and produce more environmentally friendly (green) packaging products. The willingness of the company to pay a premium for manufacturing leads to the consistent quality of their product range, although the need for improved design quality can also be seen as a 'premium service' from its suppliers.

Woolworths considers environmental issues as a serious initiative and the company has tasked its management to motivate suppliers and the entire foods division to drive and implement environmentally friendly practices with buyers. Woolworths extended its engagements with its secondary suppliers as well in order to ensure that its suppliers are sourcing their raw materials from credible certified manufactures. This strategy enables Woolworths to manage and influence the supply chain in adopting environmentally friendly practices. This has resulted in a network of companies from various industries, which Woolworths refers to as 'partners', working together to achieve the same goals.

It would be almost impossible for the Woolworths to engage with all their secondary suppliers, thus reliance has been placed on primary suppliers. This method can be seen to be at arm's length whereby Woolworths is cautious on its engagement with suppliers. Some suppliers could therefore be uneasy with Woolworths' commitment to the partnership as a result of the caution exercised by the retailer. The decision to adopt green supply chain management principles is done through consultative and not unanimously at top level which could hinder the rate of progress on greening the supply chain.

The adoption of new environmentally friendly packaging is dependent on the category of buyer within the department in consultation with their relevant stakeholders such as food technology, communication, sales and marketing. This suggests a well-planned and logical approach to GSCM within the company. Aligned to their business values, this is facilitated through internal individual and departmental balanced scorecards to ensure that buyers are encouraged to consider non-financial measures on product listings.

## 4.6 Description of the green supply chain

Using the GSCM diagram in Chapter 2, Woolworths green supply chain model can be described as follows:

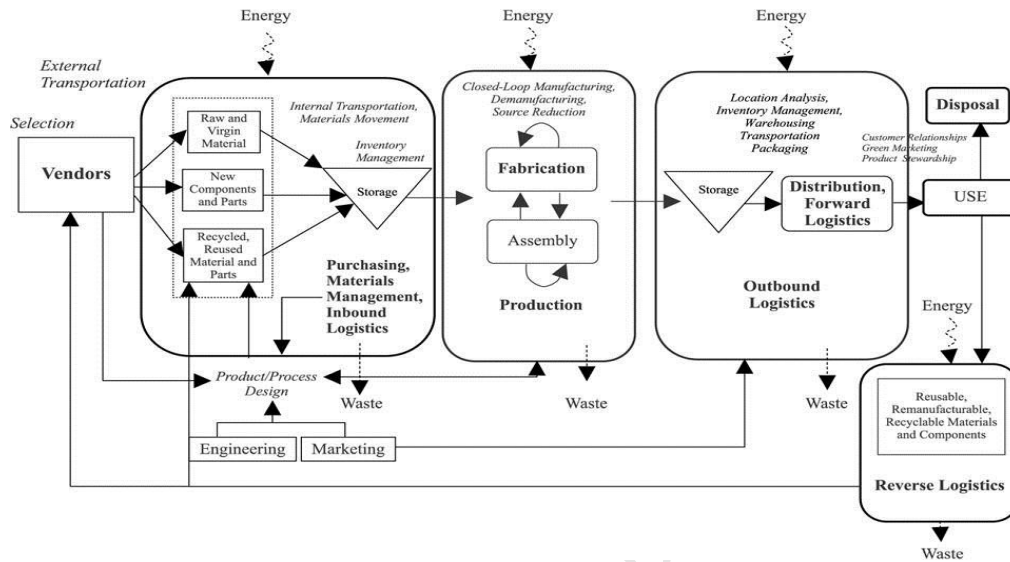


Figure3: Graph of the Green Supply Chain

### ❖ Sourcing and Production

Woolworths requires all its suppliers to source their own raw materials for each product manufacture. The company has become more involved with suppliers where they can identify and influence the type of raw materials suppliers can use to manufacture their products. The buying department makes the decision on product range and design, and then negotiates pricing and delivery with a relevant supplier prior to placing the order. The decision to direct suppliers to source products is entirely based on the buying department's strategy. Not only is it essential that suppliers are able to ensure a constant supply of the product at the required quality to meet consumer expectations but they must also maintain competitive pricing and further research and development.

In this particular instance of supplying recycled plastic trays to Woolworths for food packaging, the supplier ensured that its strategy is in line with Woolworths' philosophy. For Woolworths to adopt a supplier's product that is true to its values, the supplier needs to ensure that it is exclusive to Woolworths only. This strategy is part of Woolworths' business decision with regard to competitive strategy within a market niche on its products.

The company supports its suppliers on the use of actual market data (by means of weekly sales reports) in planning their production runs to manufacture products that are exclusive to the Woolworths brand. However, the company is finding it difficult to transform the prevailing attitude within its supplier base, that they should simply be provided with orders, and not expected to analyse the markets too.

Supplier collaboration is perhaps at its highest level with primary suppliers that the foods department uses to fulfil orders. Even though some suppliers are not completely dependent on Woolworths for business, they do share a greater degree of trust and more disclosure of information than suppliers who solely provide products to Woolworths' competitors. In return, Woolworths is pursuing market share growth, which increases supplier sales and expands their product offering across other relevant range of products. This control measure ensures Woolworths is able to manage and influence its SCM, which puts them in a favourable position in demanding the conversion of their supply chain to green.

#### ❖ **Inventory**

Woolworths mitigates the cost and risks associated with large stocks of by assigning close to half of the total packaging stock to replacement for a minimum of three months. This makes suppliers responsible for holding stock, and results in an even flow of products from the production lines. The strategy behind this requirement is that it enables Woolworths to continue business operations whilst securing stock from another supplier. Woolworth assures the supplier of acquisition of the stock even if relations were to be terminated. At any particular time, at least ten percent (based on a planning and model stock system) of all replacement items are kept at the suppliers' premises.

A cross-dock system (picking slot) is used where suppliers 'pick and pack' crates for individual stores according to actual sales data and/or purchase orders placed. These crates are delivered by suppliers, sorted at the distribution centre (DC), and then sent to local stores throughout the region. The stock is received in a temperature controlled warehouse in the DC and stored until it is dispatched to stores. The group's Foods Division distribution network is leveraged to reduce transportation costs, where feasible.

### ❖ Sales and distribution

The Woolworths distribution network covers 419 stores in South Africa, the rest of Africa and the Middle East, with South Africa housing the majority of the stores. South Africa has three major DCs, located in Cape Town, Durban and Johannesburg. Bloemfontein and Port Elizabeth have similar smaller capacity distribution warehouses.

The packaging manufacturer delivers its products to the content manufacturer who in turn delivers to these DCs and distribution warehouses on a daily basis. Known as the flow-through system, stock is received and packed for delivery the same day. Woolworths makes use of temperature controlled trucks to transport food items directly from the DC to stores daily, which is organised by route stores to deal with this diverse sourcing and sales pattern.

Distribution to stores is carried out through a delicate and complex logistics network, organised as per region and route. Deliveries to stores are made according to online replenishment plans and economic order quantities. The system is fairly accurate and reliable, and the integrity of its data has not been called into question as yet.

### ❖ Information sharing

Woolworths has indicated that it has the desire for increased co-operation and visibility along the entire green supply chain. However, in some instances the current processes in the Foods Division have only limited collaboration and information sharing between head office and suppliers. Although there seems to be a reasonable degree of voluntary information sharing between suppliers and the company, it is still a concern. Due to the limit contractual relationship most probably suppliers are discouraged to fully play open book as their trade secrets are not entirely guaranteed to be kept confidential.

However, the total green supply chain view from bottle collectors to recycling, to rPET production and packaging manufacturer, through suppliers and manufacturers to retail stores is available.

## 4.7 Targets and assessment on green supply chain

One of Woolworths' key initiatives under the environmental pillar of their programme includes the reduction of packaging. The Woolworths green supply chain performance is measured by using the following table of metrics (among others), which indicates environmental commitment and progress:

Table 1: Commitment and Progress under the environmental pillar (The Good Business Journey Report 2010)

Commitment	2010	2009	By 2012
Foods packaging reduction	<b>660 tons</b>	320 tons	2 000 (20% reduction)
Recyclability of foods packaging	<b>66%</b>	50%	90%
Recycled content in foods packaging	<b>24%</b>	23%	25%
Recycling symbols on foods packaging	<b>83%</b>	79%	90%
Woolworths recycling facilities	<b>8</b>	0 (Except for CFL recycling in-store)	50
% waste-to-landfill from distribution operations	<b>16%</b>	33%	0

Woolworths' environmental strategy is to reduce, recycle and reuse products. The company has committed to reducing packaging to the absolute minimum necessary to protect, inform and promote the product. This reduction is sustained by an intensive customer education programme and working with partners to promote recycling facilities. The above Commitment and Progress report is only pertaining to the business of Woolworths and not the entire green supply chain. Such progress reports should also be benchmarked against local industry competitors and international retailers of similar philosophy, size and shape.

### ❖ Reduce

Too much post-consumer packaging waste ends up in landfills (Packing and Printing Magazine, 2010), where it could pollute the air, soil and water. Woolworths has set targets to reduce packaging to slightly more than the essential requirements of product protection and information, i.e. specifically to reduce food packaging by 20%. In the Foods Division, the



company has saved over 660 tons of packaging against its target set in 2008, by examining the packaging in 1 400 food lines, by weighing over 200 000 tons of food.

#### ❖ **Recycle and reuse**

Woolworths has also set clear targets for recycling and reuse. These include:

- including recycled material in product packaging;
- restricting packaging materials to those that can be recycled locally, and rationalising types of plastic;
- putting symbols on plastic packaging to help customers and recyclers to identify packaging for sorting easily;
- involving and influencing the packaging industry to develop more sustainable materials; and
- ensuring the recyclability of all in-store food packaging.

#### ❖ **Recycling**

Woolworths dedicated itself to establishing a national programme of supporting the recycling of customers' waste. Measures put in place to achieve this include Western Cape in-store communication around the nearest municipal recycling facility to each Woolworths' store. Along with partners Engen and Nampak, the company began testing recycling facilities at eight Engen service stations around in the Cape Town region. This pilot project offers residents the convenience of dropping off their glass, paper, plastic and cardboard for recycling, whilst filling up their vehicles or shopping at selected Woolworths Foodstops and Engen convenience shops.

Woolworths is thus working with the local recycling industry to increase the demand for recycled products and to ensure a market for recycling in South Africa. However, the company has encountered a number of obstacles in meeting their target. These include customer demand for recycling, challenges around collection points and separation of waste, and education required for both employees and customers around waste management and recycling.

The recycling project is well supported by customers: over 110 tons of recyclable materials have been collected from the pilot sites in 9 months, and the regularity of collections has been

increased at all sites. The plan is to install recycling facilities at an additional fifty Engen sites nationally, making use of larger recycling facilities, which are presently being manufactured in South Africa. To date progress is as follows:

- 24% of Woolworths' product lines in foods currently contain recycled packaging materials, with a target of 25% for 2012;
- Woolworths has also committed to contributing to the investigation of compostable packaging solutions and has tested two new compostable packs;
- Woolworths continues to search for raw material that has been independently certified as coming from approved sustainable sources, such the material certified by the Forestry Stewardship Council (FSC); and
- Over 83% of Woolworths' food lines have symbols on the plastic packaging to help customers and recyclers easily to recognize packaging for resorting.

The company tracks progress by business unit against its indicators, and it has included Good Business Journey performance measures in the Balanced Scorecard of their teams.

Woolworths' comprehensive measurement and tracking system is well embedded in business activities, and progress measurements are done periodically. These scores reflect the division's progress as a unit towards the stated organizational targets, at both a corporate and key indicator level (i.e. transformation, economic, governance, social and environmental).

The company has put in place an assurance framework and an internal audit coverage plan, which has been completed for the Good Business Journey in areas where external verification is not available. Verification by an external organization of their carbon footprint was completed as a step toward a broader assurance process. The Good Business Journey process is strongly integrated into the company's risk model, and its risk profile is reviewed annually by the Sustainability Committee. This committee plays a vital oversight role in ensuring that structures and policies are in place to enable effective delivery of their Good Business Journey targets by management. The Sustainability Committee is a board committee chaired by a former joint managing director of the division that is now a senior non-executive director. Having the Sustainability Committee as a sub-committee of the board indicates the level of commitment the company has focused on greening their supply chain.

Table 2: Key Sustainability Indicators (The Good Business Journey Report 2010)

Indicator	2010	2009	2008	Progress
Food market share	8.3%	8.5%	9.2%	↓
Good Business Journey index overall score	84%	79%	77%	↑
Food packaging reduction (towards 20% reduction by 2012)	6.6%	3.3%	Benchmark year	↑

## 4.8 Integrated performance management system (IPMS)

Woolworths uses the Balanced Scorecard model as a management control system for their suppliers, which can be customised to operational requirements. Suppliers are generally evaluated on the four perspectives of the scorecard defined by Kaplan and Norton (1992) including sustainability. Woolworths uses an internal and external scorecard for evaluating performance. The perspectives will be discussed in sections below.

### ❖ Retailer BSC

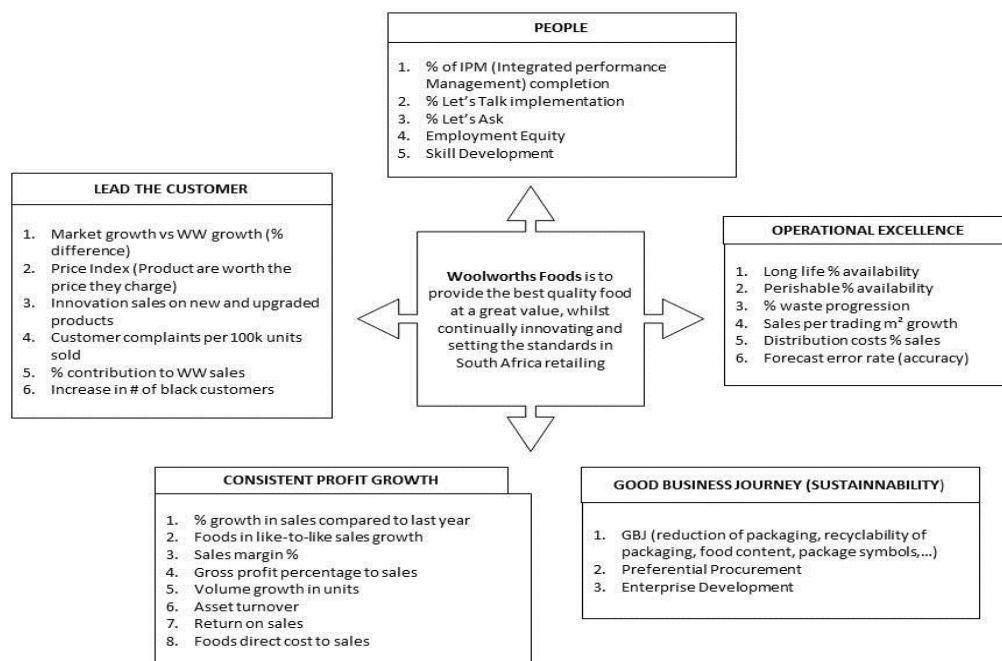


Figure 4 - Woolworths BSC retailer side (Adopted from Cano, 2010. Management Control Systems for Sustainable Food Supply in South Africa: a Case Study for Woolworths, p 26)

Under normal circumstances Woolworths assesses suppliers only in terms of quality, profitability and sustainability. Woolworths' emphasis is on suppliers that provide the desired profit contribution to their profit margin, facilitating their focus to engage with those that bring them most of their revenues. The different profitability measures in place look at volume, sales, cost, margin, waste and adherence to trading terms, such as quality, on time delivery, rebates, etc. Management Information Systems in place are flexible and adaptable to supplier needs although suppliers are aware that they need to comply with the company's standards which are an integral part of their relationship. Woolworths can restructure trading terms by improving payment terms, reduce rebates and give non-financial rewards in order to maintain a mutually beneficial, healthy and long lasting relationship. The close and flexible relationship Woolworths has with suppliers allows them to grow together and reach levels of growth unattainable with other retailers. This puts Woolworths in a favourable position with a high level of bargaining power on trade negotiations, usually resulting in a win-win relationship (Cano, 2010).

In relation to people, Woolworths ensures that employee performance objectives are aligned to the its operational and value-based objectives. These objectives are communicated from the top management level and filtered through the whole organisation, including stores, and indirectly to suppliers. Performance assessment of these objectives is completely engaged at all levels through the appraisal process. Often as a result of reviews, areas of development are identified, and support and training provided were deemed appropriate. This is in line with the main objective of learning and growth, to determine the infrastructure that agrees with reaching the objectives of the other perspectives, in order to create long-term growth for the company (Cano, 2010).

As outlined by Kaplan and Atkinson (1998), management values have shown an increasing recognition of the importance of customer focus and satisfaction in business. Woolworths has a strict policy toward customer complaints and therefore maintains a comprehensive management customer complaint system. These complaints are logged on the system and managed from the top. Woolworths' staff goes to extreme lengths to investigate and resolve these customer complaints. For any quality related issues with products, a commercial manager or buyer would handle the dispute by making contact with the customer to fully comprehend it and then liaise with its technical department and supplier to resolve the matter

expediently. Once the dispute has been resolved, the manager would contact the customer and inform them about the outcome. Woolworths invests in customer communication which is done through print and digital to media notify on product development and quality improvements Woolworths “leads the customer” by regular assessment of local and international market trends to develop unique competitive products that meet customer needs.

Internal processes are well mapped out in order to attain operational efficiency at all times. Woolworths has recently implemented a customised online management information system that enables them to have a fully comprehensive view over their supply chains for total quality management (TQM). The key element of this is to facilitate information from the suppliers to the stores and vice-versa. Therefore orders are automatically placed by the system with the supplier in-terms-of economic order quantities (EOQ) aligned to its just-in-time (JIT) delivery process. This enables Woolworths to have a single access point to retrieve their supplier’s and product reports, such quality audits, trading terms, availability and forecasted production quantities. With this system, Woolworths is able to intervene in due time on anticipation of problems and liaise directly with the supplier. Other management information systems that are used in conjunction with the TQM system are Oracle (financial system) and Pathfinder (traceability system). These systems are integrated through the BSC to allow Woolworths to maintain a balanced perspective on supplier relations.

Sustainability includes social, economic and environmental aspects in their BSC. The environmental aspect measures the percentage of waste generation, carbon footprint and the impact of waste-to-landfill from distribution operations.

## ❖ Supplier BSC

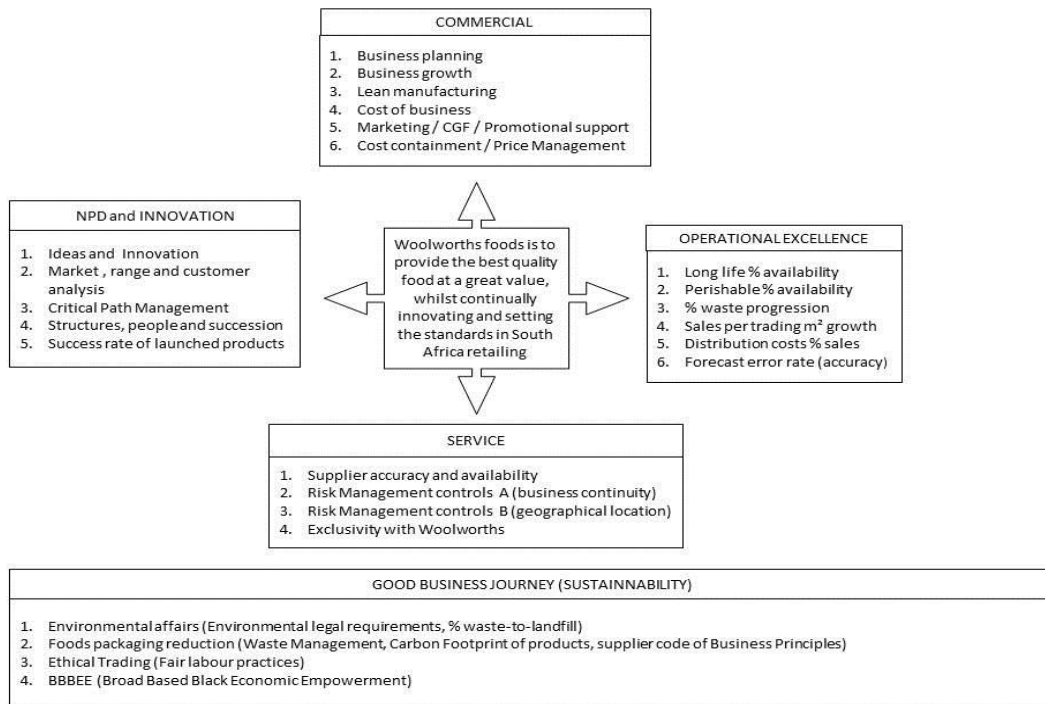


Figure 5 - Woolworths BSC supplier side (Adopted from Cano, 2010. Management Control Systems for Sustainable Food Supply in South Africa: a Case Study for Woolworths, p 31)

Woolworths assess suppliers in terms of commercial ability, technical infrastructure, product innovation, service levels and alignment to their sustainability strategic objective. Suppliers are generally ranked into four categories, namely provisional, bronze, silver and gold, which are assigned to a point system. Suppliers are ranked according to the outcome of the specific points obtained according to the appropriate criteria (Cano, 2010).

The initial aspect of commercial capability is focused on evidence of business planning, business growth, lean manufacturing, cost of business (transaction cost), marketing or promotional support and structures, people and succession. Assessment of these aspects at different levels is conducted on the supplier side. For instance Woolworths would ascertain whether Extrupet is conducting further research on product development such as possible increasing the content of recycled material into its rPET to maybe 40% content. This would be demonstrated by samples of their lab test results which would form part of their business plan and product development strategy. Woolworth provides incentives to suppliers who

continue to conduct product research and development initiatives, in order to assist them in attaining in their own objectives.

In terms of integrated financial measures, Extrupet does not share their overall business profit margins with the retailer. Transparency is based to the extent of how the cost of rPET to the retailer is composed. The supplier would disclose its key financial indicators in price negotiations over trading terms. Woolworths would normally push to increase their margin with the exception of scenarios like this one where costs have already been reduced drastically and the intent is to provide product development capacity to the supplier. The trading terms negotiation is rather focused on product development and diversity as their product is of a competitive advantage to Woolworths. Extrupet is in a unique position then other regular suppliers in that no other company offers an alternative product therefore it is in Woolworths' best interest for the company to be sustainable. Extrupet is aware Woolworths is on a position of power, where Woolworths to terminate the contract they would be able to recover some of those losses as a result of its exclusivity.

Woolworths' perspective is to assess the supplier in terms technical infrastructure and skills capacity. Measures are in place to assess technical issues such safety standards and that of the equipment, technical resources, quality audits and standards are adhered to. The quality of the products is benchmarked against the number of complaints from customers versus targeted complaints of their annual trading cycle, and sometimes on shorter periodic cycles. With this particular business arrangement it is not possible to benchmark otherwise as it is a unique business product to Woolworths. Customer feedback is the primary means of assessing performance in the market. By not getting formal feedback from the customers does not necessarily translate to good news, thus retailer also relies on sales volume of the product to confirm acceptance in the market place. Another method of assessment used is to monitor product spoilages and number of returns against category norms.

Another criterion, Woolworths evaluates suppliers on new product development and innovation capabilities. Woolworths has other measures for regular suppliers such new products launched. With this specific relationship, the measure in focus is on improving on the current rPET product to its possible maximum composition of recycled content. The current target for the rPET plastic sheets is to them composed of 30% recycled material. The

other objective is to recycle the recycled material into the same rPET without compromising food grade quality.

Woolworths evaluates their suppliers on historical service levels. Measures for service levels include accuracy, availability, risk management and exclusivity to Woolworths. The fulfilment of orders, accuracy and availability are measured in terms of supply chain efficiency. The supplier needs to provide detailed information strategies on business continuity, contingency plans and top management succession plans, to Woolworths. The feasibility of the supplier is assessed in terms of product risk management on how and where it sources its raw material and the sustainability thereof.

The supplier is evaluated in terms of enterprise sustainability, being the measure of how they conduct business. Woolworths conducts regular audits of suppliers and explores the various aspects during these assessments. The environmental aspect is fundamental in assessing the management of its operations by the supplier. Aligning with its Good Business journey objectives, audits integrate technical measures about soil management, water management, chemical management, pollution management, energy usage, waste and solid waste management. Incorporated in the evaluation system of vendor management is the measure of their ecological footprint.

Extrupet collects huge volumes of waste material which at times is not of the required grade for recycle and the labelling removed. Also through production process some of the material is rejected at the end of the process as a result of spoilage. Woolworths assesses how the business disposes of this material and the impact it has on the environment. Extrupet has to display contingency measures on how to deal with chemical spillages and minimise its effect on polluting the soil. Measures are also in place for managing the use of water and sustaining it as a resource for production, which is recycled through its own process for re-use. Woolworths has set KPIs that the supplier needs meet and improve year-on-year. Ethical trading measures go beyond the boundaries of the business to include the supplier's supplier and implementation of fair labour practices. They consist of training and development programmes, performance management systems and equal opportunities measures. Extrupet already meets the requirements of BBEE guidelines as it is a black owned and managed entity. Woolworths merely assesses for continuous adherence by the supplier.



## **4.9 Supplier collaboration and enterprise development**

As part of the enterprise development (ED) strategy, Woolworths has committed to supporting existing suppliers, and developing new supplier channels to foster growth and innovation. Woolworths' ED strategic objectives are to address the challenges facing small owned businesses by assisting them in moving from being survivalist to being sustainable operations. Essential to overcome this is providing these enterprises with business opportunities.

Furthermore, Woolworths, in adhering to its strategy of building long-term relationships with suppliers and partners, has focused ED efforts on emerging organizations in the greater supply chain. Assistance is given to these suppliers through operations management and also takes the form of financial assistance loans (external or internal); structured payment terms; and grants (limited).

Woolworths realised that for the company to be able to make a meaningful contribution, it needs to partner with other organizations. Partnerships have thus been formed with organizations that provide financial and developmental assistance, as well as with those that can provide business skills training and coaching. The company regards the ED strategy as an investment in the future of its business supply chain, the wider economy and the society in which it operates.

As a retailer Woolworths places a high degree of importance on relationships that are based on mutual trust and respect. This element of co-operation and collaboration is particularly effective in building business together with current and prospective suppliers. Cooperation within its supply chain is increasing, as Woolworths delivers the right products at the right time to the right consumers.

This is essentially a backup strategy for Woolworths to have businesses that can fill any possible gap in the supply chain. The strategic intent to grow their own suppliers is to align their operations to their own business principles of conducting business. This ensures that the enterprise is familiar with the Woolworths' values at an early stage and if an opportunity arises within the supply chain it becomes a seamless process to manage the gap. Furthermore the supplier perceives the retailer as a business partner, in a mutually beneficial relationship

thus enhancing commitment result in greater loyalty from the supplier. With this strategy, Woolworths is able to secure a continuous supply chain which they can align to their business model.

## **4.10 Discussion**

As found in the literature for SCM, some authors such as Hervani et al (2005) have focused their attention in particular: distribution efficiency and minimizing system wide costs of the chain. This is achieved through various innovative and strategic mechanisms in order for all parties to realize benefit from participating in the transaction. It is widely accepted that SCM is a business process engaged through linkages to create value in the supply of products and services to the consumer or end-user (Tsamenyi, Cullen & Chivaka, 2005). A normal supply chain requires limited engagement amongst the entities involved in-terms-of product design, planning and operations. The ultimate disposal of waste generated and of products is not of primary concern in a normal supply chain. Woolworths had realized the benefits of SCM and took full advantage of the concept by widely applying it in its business model. This enabled Woolworths to develop a strategic competitive advantage over its competitors, which ensured a regular supply of goods and maintenance of the requisite quality standards.

Furthermore, in the literature review the studies observed that the development of GSCM was influenced by operational and strategic contexts (Hervani et al, 2005). These practices initially entailed product design, process design, manufacturing practices and a broad combination of these elements within various contexts of greening the supply chain. Although encouraged by an environmentally conscious outlook, companies recognized how to become more competitive using GSCM. Woolworths has also recognized this approach by implementing environmentally conscious practices within its supply chains. This has enabled Woolworths to further distinguish itself from its competitors not only by product quality but recognizing the impact of its products on environment of the consumers.

Many authors recognised GSCM initiatives required more collaborative efforts for implementation in a supply chain. This not only involved huge capital investment but also assessing GSCM factors and performance measurement of the supply chain (Beamon, 1999). It became overwhelmingly clear to organizations that trust is a significant factor in

information sharing (Cheng et al (2008), in transformation of supply chains. On implementation of GSCM practices, Woolworths is already in a unique position in that they already have embedded working relations with their in-house brand suppliers.

Despite the various product suppliers, Woolworths uses a standard scorecard and audit process for all suppliers irrespective of the nature of the relationship. Suppliers are rated on a multitude of criteria to which they are assigned a status of bronze, silver and gold. This enables Woolworths to maintain consistency and integrity in the manner in which they select and manage suppliers as they are required to comply with the same requirements. Moreover, the managers can assign a “provisional” status to entities that just satisfy the minimum requirements desirable for becoming a supplier to Woolworths (Cano, 2010). This is consistent with their enterprise development strategy of growing suppliers from within their supply chain network.

Although Woolworths maintains high standard of values which are incorporated in product design and quality infused with value related attributes, they are lacking in customer education and on communication. The product does not sufficiently inform the customer of these value related attributes and how it has been materially composed. No clear management control system has been identified but a combination of them is applied and Woolworths depends on its internal procedures to manage and control these values for suppliers. Woolworths also assesses suppliers on cultural fit within their brand values and adoption of these values by the supplier (Cano, 2010).

With regard to integrated performance management, the indicators included in the basic model of the BSC were ranked on the basis of the judgement of management. This is supported by information collected during supplier reviews and audits, as well as forwarded by the supplier as per requirement (Cano, 2010).

For Woolworths, even sustainability is at the forefront of product development, consistent profit growth and customer perspectives are perceived to be the most vital, before internal processes, sustainability and learning and growth perspective. The Margin (Gross Profit) derived from the product is the key financial measure which is used to measure internal performance of managers. Other typical financial indicators such as, ROI, are perceived to be less important. Insofar as the customer perspective is concerned, the practicality and

functionality of the product is perceived to be the most important indicator. The Good Business Journey report is considered the most important sustainability indicator as it serves the purposes of a dashboard and communication to key stakeholders (which includes the commitment to reduce the impact that packaging has on the environment by introducing recycled material in across its supply chain) (Cano, 2010).

To the extent of that Extrupet is concerned, its perspectives and indicators evaluation are resultant from Woolworths' KPIs, endorsing some of the retailer's. Even though all measures are ranked similarly, commercial and service perspectives are regarded to be the most vital measures. Management regard the supplier service track record and business planning and growth are the most imperative when considering the commercial and service perspective. These are surpassed by the contribution margin to Woolworths' profits. Innovation (product development) and quality are also regarded as vital which ensure the supplier remains competitive to external companies wanting to enter this market.

On comparison of the BSC scorecards it seems the two complement each entity's role in the partnership. Such as operational excellence on the retailer side is translated as technical and service excellence at the supplier side and lead the customer is innovation for the supplier. Moreover Woolworths is fixated on quality and this has been transferred appropriately to the supplier's BSC (Cano, 2010). Lastly, sustainability is an integral part of both scorecards, whereas it covers different aspects at the supplier compared to the retailer.

There is a large incentive that can be enjoyed by firms like Woolworths when they integrate environmentally conscious practices with SCM. As observed during the case study, it improved economic performance, reduced costs, increased customer service level, efficiently utilized resources, effectively contributed to environmental impact, minimized government intervention, and enhanced market responsiveness capability. Product innovation together with information technology enables the integration of environmentally conscious practises with distribution strategies. This also enables management to make the supply chain more transparent, flexible, as well as energy- and cost-efficient by encouraging product development across the entire chain. As detailed having been observed during the case study, all these areas are comprehensibly covered at Woolworths which demonstrate their operational capabilities in terms of SCM being the leader in its class.

Although Woolworths has managed to green its supply chain on sandwich plastic packaging, in broader societal context it is merely a competitive strategy for differentiation. The technologically advanced product, rPET, has not been extended to other food retailers or producers that make use of food grade PET. As demonstrated in the case study, environmentally friendly practices can become self-benefit initiatives. The ideological concept of reducing the impact of pollution toward the environment seems to take into consideration individual contribution rather than the broader societal impact. If this technologically advanced food packaging were to be extended to other retailers and food types, it would have a much greater impact in curbing pollution, as intended.

#### **4.11 Summary**

The case study has shown how Woolworths has managed to green its supply chain for sandwich plastic containers and effectively manage relations with its supplier. This has been achieved through partnership and collaboration with its supplier, Extrupet. The supplier made a considerable investment in developing and acquiring specific equipment to be able to recycle and produce food grade plastic as required by Woolworths. In return Woolworths has committed to support the supplier in being the sole buyer of its product.

Even though Woolworths has extensive engagement in supply chains, the challenge of managing relations in this specific relationship was recognised upfront. The resolution was the adoption of a customized BSC which would be reciprocal to both Woolworths and the supplier. On Woolworths' side, suppliers are rated on a multitude of criteria to which they are assigned a status. On comparison of the scorecards it seems the two complement each entity's role in the partnership. Such as operational excellence on the retailer side is translated as technical and service excellence at the supplier side and lead the customer is innovation for the supplier. Moreover Woolworths is fixated on quality and this has been transferred appropriately to the supplier's BSC (Cano, 2010). Sustainability is an integral part of both scorecards, whereas it covers different aspects at the supplier compared to the retailer.

Woolworths enjoys a large incentive from integrating environmentally conscious SCM practices. It has improved economic performance, reduced costs, increased customer satisfaction levels, efficiently utilized resources, effectively contributed to environmental

impact, minimizes government intervention, and enhances market responsiveness capability. Product innovation combined with information technology has enabled the integration of environmentally conscious practises with distribution strategies. This has allowed management of both entities to enable a more transparent, flexible, as well as energy- and cost-efficient supply chain by encouraging product development. All these areas are comprehensibly covered at Woolworths which demonstrate their operational capabilities which are consistent with them being a leader GSCM.

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## **CHAPTER FIVE: CONCLUSION**

This case study examined the operation of the Balanced Scorecard as a management control system in driving inter-company relationships to implement green supply chain management at Woolworths. Drawing on challenges of initial investment that face the supplier and retailer (Heying & Senzaro, 2009), the study examined the level of collaboration required to facilitate the development of environmentally conscious supply chains. Furthermore, the study examined the risk associated with making intensive capital investment to “green” the supply chain and that of opportunism faced by both organizations.

The case study was conducted by means of interviews and the collection and analysis of data relating to Woolworths, a single retail group of companies. Additional sources of information included the company’s annual reports, website, newsletters, trade publications and business magazines.

While some findings have emerged from the case study, performance management of green supply chains is contingent to the level of commitment and dedication of the organization’s management to attaining a defined objective. The results substantiate the need for financial and non-financial measures in evaluating inter-organizational performance using the BSC model, adapted to an operational context. Trust and transparency facilitate the level of engagement and the extent of adequate disclosure in managing inter-company relations. Not only does green supply chain has tangible and intangible benefits to both buyer and supplier, it improves the negative impact of waste material onto the environment.

Although cost savings and customer value are at the forefront, sustainably long-term buyer-supplier relationship is fundamental to development of GSCM. Organizational values encourage the implementation of environmentally conscious practices in supply chains, which become deeply instilled in organizational culture. The case study confirms that the need for retailer-supplier collaboration, from product sourcing to post consumer disposal. Such association requires working together to streamline processes involved in the product life cycle.

Limitation of the case study is that it only examined Woolworths, a single retail group and one of its single suppliers that have a strong relationship. An opportunity for further research would be to investigate the application of the BSC model on “greening” packaging for other food and non-food products such as clothing and home wear and by other food retail groups in South Africa. to assess feasibility in the development and implementation of green supply chains.

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